

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 r 1  
 Edition : 21.08.91  
 Replaces : 7.1.91  
 Test oil : ISO-4113

Combination no. : 0 402 736 814

Injection pump  
 Pump designation : PES6P110A12ORS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964-6  
 K  
 Governor no. : 0 421 815 258

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 187.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1200

---

Rack travel in mm : 14.50...14.60

---

Del.quantity cm<sup>3</sup>/ : 18.3...18.5  
 100 s: (18.0...18.8)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm<sup>3</sup>/ : 2.7...3.3  
 100 s: (2.5...3.5)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.80...2.00

2nd speed rpm : 450  
 travel mm : 3.10...3.50

3rd speed rpm : 700  
 travel mm : 5.90...6.30

4th speed rpm : 1200  
 travel mm : 9.00...9.20

5th speed rpm : 1400  
 travel mm : 10.70...11.10

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 1200  
 Del.quantity : 183.0...185.0  
 1000 : (180.0...188.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1405...1435  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 650  
Rack travel in m: 11.60...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 1200

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 270  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 700  
Rack travel in m: 12.60...13.00

START CUT-OUT

A02

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 167.5...173.5  
1000 s: (164.5...176.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3917089

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 5  
 Edition : 21.08.91  
 Replaces : 7.1.91  
 Test oil : ISO-4113

Combination no. : 0 402 736 815

Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1000PA964-7  
 K  
 Governor no. : 0 421 815 259

Customer spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 194.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

---

Rack travel in mm : 15.80...15.90

---

Del.quantity cm<sup>3</sup>/ : 21.7...21.9  
 100 s: (21.4...22.2)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 5.6...5.8  
 Del.quantity cm<sup>3</sup>/ : 2.7...3.3  
 100 s: (2.5...3.5)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.60...1.80

2nd speed rpm : 450  
 travel mm : 3.00...3.40

3rd speed rpm : 600  
 travel mm : 5.20...5.60

4th speed rpm : 1000  
 travel mm : 8.40...8.60

5th speed rpm : 1150  
 travel mm : 9.80...10.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1500  
 Del.quantity : 217.0...219.0  
 1000 : (214.0...222.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 14.30  
Speed rpm : 1050...1060  
2nd rack travel in: 4.00  
Speed rpm : 1205...1235  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack trave: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.80...15.90  
2nd speed rpm : 650  
Rack travel in m: 14.00...14.40  
3rd speed rpm : 1000  
Rack travel in m: 15.30...15.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1500  
Rack travel mm : 15.80...15.90

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 340  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 840  
Rack travel in m: 13.60...14.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 650  
Del.quantity cm3/ : 211.0...217.0  
1000 s: (208.0...220.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 98.0...102.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.30  
Speed rpm : 1050...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.90...11.90

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3916629

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 2  
 Edition : 21.08.91  
 Replaces : 7.1.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 816  
 Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964-8  
 K  
 Governor no. : 0 421 815 264

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 213.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 115...125  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

A05

BEGINNING OF DELIVERY

Test pressure, bar: 22...24  
 Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4  
 Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 14.70...14.80  
 Del. quantity cm<sup>3</sup>/ : 19.0...19.2  
 100 s: (18.7...19.5)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 5.6...5.8  
 Del. quantity cm<sup>3</sup>/ : 2.7...3.3  
 100 s: (2.5...3.5)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 450  
 travel mm : 3.10...3.50  
 3rd speed rpm : 700  
 travel mm : 5.90...6.30  
 4th speed rpm : 1200  
 travel mm : 9.00...9.20  
 5th speed rpm : 1400  
 travel mm : 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del. quantity : 190.0...192.0  
 1000 : (187.0...195.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.20  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 650  
Rack travel in m: 12.60...13.00  
3rd speed rpm : 1200  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 14.70...14.80

Measurement  
Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 335  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 785  
Rack travel in m: 12.80...13.20

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 181.0...187.0  
1000 s: (178.0...190.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3916626

Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 t2  
 Edition : 28.06.91  
 Replaces : 1.2.91  
 Test oil : ISO-4113

Combination no. : 0 402 736 817

Injection pump  
 Pump designation : PES6P120A720/3LS7209  
 EP type number : 0 412 726 837  
 Governor  
 Governor design. : RQV300...1000PA962-3  
 K

Governer no. : 0 421 815 270

Customer-spec. information

Customer : MAN

Engine : D2866LF09

1st version kW : 309.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

A07

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 15.00...16.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60  
 & maximum rack tra: 15.0...16.0  
 Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 29.9...30.1

100 s: (29.6...30.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.8...5.2

Del.quantity cm<sup>3</sup>/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045

travel mm : 8.30...8.50

2nd speed rpm : 300

travel mm : 1.90...2.30

3rd speed rpm : 500

travel mm : 4.00...4.60

4th speed rpm : 900

travel mm : 6.50...6.90

5th speed rpm : 1350

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900  
Aneroid pressure h : 1300  
Del. quantity : 299.0...301.0  
1000 : (296.0...304.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 284...292

Testing:

1st rack travel in: 12.40  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 239...247

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 300...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1000  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 750  
Rack travel in m: 12.90...13.10  
4th speed rpm : 400  
Rack travel in m: 12.00...12.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1300  
Rack travel mm : 13.90...14.00

A08

Measurement

Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 9.00...9.20  
2nd pressure hPa : 220  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 720  
Rack travel in m: 11.50...11.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300  
Speed rpm : 1000  
Del. quantity cm<sup>3</sup>/ : 271.0...277.0  
1000 s: (268.0...280.0)  
Aneroid pressure h: 1300  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 281.0...287.0  
1000 s: (278.0...290.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 168.0...170.0  
1000 s: (165.0...173.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del. quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7094

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 t3  
 Edition : 28.06.91  
 Replaces : 18.2.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 818  
 Injection pump  
 Pump designation : PES6P120A720/3LS7209  
 EP type number : 0 412 726 837  
 Governor  
 Governor design. : RQV300...1000PA960-4  
 K  
 Governor no. : 0 421 815 272

Customer-spec. information  
 Customer : MAN

Engine : D2866LF09  
 1st version kW : 309.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

A10

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 15.00...16.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60  
 & maximum rack tra: 15.0...16.0  
 Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 13.90...14.00  
 Del. quantity cm<sup>3</sup>/ : 29.9...30.1  
 100 s: (29.6...30.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 4.8...5.2  
 Del. quantity cm<sup>3</sup>/ : 2.0...2.6  
 100 s: (1.7...2.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 1045  
 travel mm : 9.50...9.70  
 2nd speed rpm : 300  
 travel mm : 1.40...1.80  
 3rd speed rpm : 500  
 travel mm : 3.50...4.10  
 4th speed rpm : 900  
 travel mm : 7.70...8.10  
 5th speed rpm : 1350  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900  
Aneroid pressure h: 1300  
Del. quantity : 299.0...301.0  
1000 : (296.0...304.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 294...302

Testing:

1st rack travel in: 12.40  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 247...255

Testing:

Speed rpm : 100  
Minimum rack trave: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 300...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1000  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 750  
Rack travel in m: 12.90...13.10  
4th speed rpm : 400  
Rack travel in m: 12.00...12.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1300  
Rack travel mm : 13.90...14.00

Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 9.00...9.20

2nd pressure hPa : 220

Rack travel in m: 9.40...9.50

3rd pressure hPa : 720

Rack travel in m: 11.50...11.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300  
Speed rpm : 1000  
Del. quantity cm<sup>3</sup>/ : 271.0...277.0  
1000 s: (268.0...280.0)  
Aneroid pressure h: 1300  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 281.0...287.0  
1000 s: (278.0...290.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 168.0...170.0  
1000 s: (165.0...173.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del. quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7095

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery





**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 11,9 t5  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 820  
 Injection pump  
 Pump designation : PES6P120A720/3LS7209  
 EP type number : 0 412 726 837  
 Governor  
 Governor design. : RGV300...1000PA960-5  
 K  
 Governor no. : 0 421 815 286

Customer-spec. information  
 Customer : MAN

Engine : D2866LU04

1st version kW : 309.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 15.00...16.00  
 Firing order : 6-2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 4.40...4.60  
 & maximum rack tra: 15.0...16.0  
 Difference ° CS : 1.75...3.25

**BASIC SETTING**

1st speed rpm : 750

Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 29.4...29.6

100 s: (29.1...29.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.4...5.8

Del.quantity cm<sup>3</sup>/ : 3.3...3.9

100 s: (3.0...4.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1045

travel mm : 9.80...10.00

2nd speed rpm : 300

travel mm : 1.50...1.70

3rd speed rpm : 500

travel mm : 3.20...3.80

4th speed rpm : 900

travel mm : 8.10...8.50

5th speed rpm : 1350

travel mm : 13.00...14.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1075

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750  
Aneroid pressure h : 1300  
Del. quantity : 294.0...296.0  
1000 : (291.0...299.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 295...303

Testing:

1st rack travel in: 12.80  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 249...257

Testing:

Speed rpm : 100  
Minimum rack travel: 7.10  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70

CONSTANT REGULATION

Speed rpm : 300...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 900  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 1000  
Rack travel in m: 13.70...13.90  
4th speed rpm : 600  
Rack travel in m: 12.50...12.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1300  
Rack travel mm : 13.70...13.90

Measurement

Speed 1/min : 1000

1st pressure hPa : -

Rack travel in m: 9.00...9.20

2nd pressure hPa : 200

Rack travel in m: 9.40...9.50

3rd pressure hPa : 650

Rack travel in m: 11.50...11.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300

Speed rpm : 1000

Del. quantity cm<sup>3</sup>/ : 285.0...291.0

1000 s: (282.0...294.0)

Aneroid pressure h: 1300

Speed rpm : 600

Del. quantity cm<sup>3</sup>/ : 282.0...286.0

1000 s: (279.0...289.0)

Aneroid pressure h: -

Speed rpm : 500

Del. quantity cm<sup>3</sup>/ : 169.0...171.0

1000 s: (166.0...174.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80

Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

Del. quantity cm<sup>3</sup>/ : 210.0...230.0

1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 5.40...5.80

Del. quantity cm<sup>3</sup>/ : 33.0...39.0

1000 s: (30.0...42.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.00)

Remarks:

: MAN-NR. 3-7130

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER 12,2 b
Edition : 26.07.91
Replaces : 20.11.87
Test oil : ISO-4113
Combination no. : 0 402 746 809
Injection pump
Pump designation : PES6P120A720RS7132
EP type number : 0 412 726 806
Governor
Governor design. : RQ750PA836
Governor no. : 0 421 801 373

Customer-spec. information
Customer : PERKINS

Engine : EAGLE LE
1st version kW : 240.0
Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 019
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test lines : 1 680 750 075

Outside diameter x Wall thickness x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60
: (4.45...4.65)
Rack travel in mm : 9.00...12.00
Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700
Rack travel in mm : 15.90...16.00
Del.quantity cm3/ : 33.9...34.1
100 s: (33.6...34.4)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 300.0
Rack travel in mm : 5.9...6.1
Del.quantity cm3/ : 3.8...4.4
100 s: (3.5...4.7)
Spread cm3 : 0.8
100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Del.quantity : 339.0...341.0
1000 : (336.0...344.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 90...98

Testing:
1st rack travel in: 14.90
Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 783...798
4th rack travel in: 820
Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.90  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...240.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

Remarks:

APPLICATION :

Generator

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 12,0 a 2  
 Edition : 05.07.91  
 Replaces : 15.8.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 841

Injection pump  
 Pump designation : PES6P120A720LS7114-2  
 EP type number : 0 412 726 815  
 Governor  
 Governor design. : RQ300/1050PA774-3  
 Governor no. : 0 421 801 451

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447 LA

1st version kW : 265.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow quantity min. 1/h: 100...120

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

---

Rack travel in mm : 14.00...14.20

---

Del.quantity cm3/ : 22.9...23.1

---

100 s: (22.6...23.4)

---

Spread cm3 : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 229.0...231.0

1000 : (226.0...234.0)

Spread cm3 : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.20  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0  
Speed rpm : 300  
Rack travel in mm : 5.80...6.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 14.20...14.40  
3rd speed rpm : 700  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 14.00...14.20

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 12.00...12.20  
2nd pressure hPa : 500  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1100  
Rack travel in m: 14.20...14.40  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 10.40...10.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 1050

Del.quantity cm3/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 700  
Del.quantity cm3/ : 246.0...249.0  
1000 s: (243.0...252.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 12,0 a 5  
 Edition : 05.07.91  
 Replaces : 2.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 859

Injection pump  
 Pump designation : PES6P120A720LS7114-2  
 EP type number : 0 412 726 815  
 Governor  
 Governor design. : RGV300...1050PA940-2  
 Governor no. : 0 421 813 826

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447 LA

1st version kw : 265.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

---

Rack travel in mm : 14.00...14.20

---

Del. quantity cm<sup>3</sup>/ : 22.9...23.1  
 100 s: (22.6...23.4)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.8...6.2  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.10...1.30

2nd speed rpm : 600  
 travel mm : 4.90...5.10

3rd speed rpm : 800  
 travel mm : 5.90...6.20

4th speed rpm : 1100  
 travel mm : 8.10...8.50

5th speed rpm : 1175  
 travel mm : 9.70...10.20

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1080  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



1st version  
Speed rpm : 600  
Aneroid pressure h : 900  
Del. quantity : 229.0...231.0  
1000 : (226.0...234.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 13.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.80...6.20

#### CONSTANT REGULATION

Speed rpm : 300...450

#### TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 14.20...14.40  
3rd speed rpm : 700  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 14.00...14.20

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.80...12.00  
2nd pressure hPa : 500  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1100

A21

Rack travel in m: 14.20...14.40  
4th pressure hPa : 1200  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 10.40...10.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 246.0...249.0  
1000 s: (243.0...252.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks: :

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : FOR 7,8 k 1  
 Edition : 30.08.91  
 Replaces : 16.11.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 863

Injection pump  
 Pump designation : PES6P120A720RS7179  
 EP type number : 0 412 726 826  
 Governor  
 Governor design. : RQV350...1150PA917K  
 Governor no. : 0 421 815 214

Customer-spec. information  
 Customer : FNH

Engine : 7.8L

1st version kW : 201.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 2 417 413 072

Overflow quantity min. 1/h: 160...170

Test nozzle holder assembly : 1 688 901 103

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 17...19

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1150

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 21.7...21.9

100 s: (21.4...22.2)

Spread cm<sup>3</sup> : 0.7

100 s: (1.1)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.4

Del.quantity cm<sup>3</sup>/ : 2.0...2.6

100 s: (1.8...2.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1215

travel mm : 9.40...9.60

2nd speed rpm : 350

travel mm : 2.20...2.40

3rd speed rpm : 450

travel mm : 3.40...4.00

4th speed rpm : 800

travel mm : 6.10...6.50

5th speed rpm : 1550

travel mm : 13.00...14.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 6.00...13.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1150

Aneroid pressure h: 1400  
Del. quantity : 217.0...219.0  
1000 : (214.0...222.0)  
Spread cm<sup>3</sup> : 7.00  
1000 : (11.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1210...1220  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 350  
Rack travel in mm : 5.00...5.40

CONSTANT REGULATION  
Speed rpm : 320...440

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 750  
Rack travel in m: 12.40...12.60  
3rd speed rpm : 550  
Rack travel in m: 11.30...11.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1150  
Pressure hPa : 1400  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 7.90...8.30  
2nd pressure hPa : 300  
Rack travel in m: 9.50...9.60

A23

3rd pressure hPa : 850  
Rack travel in m: 12.40...12.80

#### START CUT-OUT

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 212.0...218.0  
1000 s: (209.0...221.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 110.0...114.0  
1000 s: (108.0...116.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 13.00  
Speed rpm : 1210...1220

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 150.0...180.0  
1000 s: (145.0...185.0)  
Rack travel in mm : 10.90...11.50

Remarks: : FNH # E9HN-9A543-TA

Bow dimension:  
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 h
Edition : 21.06.91
Replaces : 28.9.90
Test oil : ISO-4113
Combination no. : 0 402 746 883
Injection pump
Pump designation : PES6P110A320RS7198
EP type number : 0 412 716 802
Governor
Governor design. : RGV275...1250PA942K
Governor no. : 0 421 815 234

Customer-spec. information
Customer : RVI

Engine : MIDR06-06-26

1st version kW : 132.5
Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.60...4.70
: (4.55...4.75)
Rack travel in mm : 12.50...13.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.00...15.00
& maximum rack tra: 20.0...21.0
Difference ° CS : 2.50...4.00

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.50...14.60

Del.quantity cm3/ : 15.4...15.6

100 s: (15.1...15.8)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 275

Rack travel in mm : 5.00...5.40

Del.quantity cm3/ : 1.8...2.3

100 s: (1.5...2.5)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 9.70...9.90

2nd speed rpm : 275

travel mm : 0.90...1.10

3rd speed rpm : 600

travel mm : 4.20...4.60

4th speed rpm : 1000

travel mm : 7.10...7.50

5th speed rpm : 1600

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1370

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1000  
Del.quantity : 154.0...156.0  
1000 : (151.5...158.5)  
Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1315...1325  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.00  
Speed rpm : 275  
Rack travel in mm : 5.10...5.30

#### CONSTANT REGULATION

Speed rpm : 350...480

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 750  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 400  
Rack travel in m: 12.80...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 11.20...11.60

A25

2nd pressure hPa : 360  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 220  
Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 119.0...123.0  
1000 s: (116.0...126.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 67.0...69.0  
1000 s: (64.5...71.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1315...1325

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 85.0...115.0  
1000 s: (81.0...119.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.00...5.40  
Del.quantity cm3/ : 18.0...23.0  
1000 s: (15.5...25.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 i
Edition : 21.06.91
Replaces : 18.2.91
Test oil : ISO-4113
Combination no. : 0 402 746 894
Injection pump
Pump designation : PES6P110A32ORS7208
EP type number : 0 412 716 803
Governor
Governor design. : RQV275...1175PA942-1
K
Governor no. : 0 421 815 244

Customer-spec. information
Customer : RVI

Engine : MIDRO60226 M

1st version kW : 210.0
Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 4.10...4.20
: (4.05...4.25)

Rack travel in mm : 13.00...14.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.00...14.10
& maximum rack tra: 20.0...21.0
Difference ° CS : 2.75...4.25

BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 14.00...14.10

Del. quantity cm3/ : 17.0...17.2

100 s: (16.7...17.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 5.00...5.40

Del. quantity cm3/ : 2.0...2.5

100 s: (1.7...2.7)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 9.70...9.90

2nd speed rpm : 275

travel mm : 0.90...1.10

3rd speed rpm : 600

travel mm : 4.20...4.60

4th speed rpm : 1000

travel mm : 7.10...7.50

5th speed rpm : 1600

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1370

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1175  
Aneroid pressure h: 1000  
Del.quantity : 170.0...172.0  
1000 : (167.5...174.5)  
Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 56...64

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.90  
Speed rpm : 275  
Rack travel in mm : 5.20...5.40

#### CONSTANT REGULATION

Speed rpm : 350...480

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 700  
Rack travel in m: 13.25...13.45  
3rd speed rpm : 800  
Rack travel in m: 13.50...13.80

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 1175  
Pressure hPa : 1000  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 1175

1st pressure hPa : -

A27

Rack travel in m: 10.30...10.90  
2nd pressure hPa : 520  
Rack travel in m: 12.30...12.50  
3rd pressure hPa : 240  
Rack travel in m: 10.90...11.30

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 148.0...154.0  
1000 s: (145.0...157.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 73.0...75.0  
1000 s: (70.5...77.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...120.0  
1000 s: (86.0...124.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.00...5.60  
Del.quantity cm3/ : 20.0...25.0  
1000 s: (17.5...27.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 11,9 x1  
 Edition : 27.05.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 905  
 Injection pump  
 Pump designation : PES6P120A720LS7227-1  
 EP type number : 0 412 726 845  
 Governor  
 Governor design. : RQ750PA981  
 Governor no. : 0 421 801 566

Customer-spec. information  
 Customer : MAN

Engine : D2866 LXE

1st version kW : 300.0  
 Rated speed : 1500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.70...4.80  
 : (4.65...4.85)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 700

Rack travel in mm : 14.30...14.40

Del.quantity cm<sup>3</sup>/ : 33.9...34.1

100 s : (33.6...34.4)

Spread cm<sup>3</sup> : 0.5

100 s : (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.2...4.6

Del.quantity cm<sup>3</sup>/ : 2.0...2.6  
 100 s : (1.7...2.9)

Spread cm<sup>3</sup> : 0.8

100 s : (1.2)

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 700

Del.quantity : 339.0...341.0

1000 : (336.0...344.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Testing:

1st rack travel in: 13.30

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 788...801

4th rack travel in: 950

Speed rpm : 0.00...1.00

**BREAKAWAY**

1st version



1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 750...755

Remarks: : MAN-NR. 3-7119

APPLICATION

Generator set



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : RVI 9,8 o 1  
 Edition : 23.08.91  
 Replaces : 26.7.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 915  
 Injection pump  
 Pump designation : PES6P120A320RS7232  
 EP type number : 0 412 726 846  
 Governor  
 Governor design. : RQ275/1050PA999-2  
 Governor no. : 0 421 801 594

Customer-spec. information  
 Customer : RVI

Engine : MIDR 06-20-45  
 1st version kw : 249.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 4.65...4.75  
 : (4.60...4.80)  
 Rack travel in mm : 18.00...21.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 600  
 Rack travel in mm : 13.10...13.20  
 Del.quantity cm3/ : 23.5...23.7  
 100 s: (23.2...24.0)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 275  
 Rack travel in mm : 4.60...5.00  
 Del.quantity cm3/ : 1.5...2.1  
 100 s: (1.2...2.4)  
 Spread cm3 : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000  
 Del.quantity : 235.0...237.0  
 1000 : (232.0...240.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 12.10  
 Speed rpm : 1125...1140  
 2nd rack travel in: 4.00

Speed rpm : 1235...1265  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 4.80

#### Testing:

Speed rpm : 200  
Minimum rack trave: 6.00  
Speed rpm : 275  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 350...390

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 1050  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.10...13.20

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 560  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 200  
Rack travel in m: 9.60...10.00

#### START CUT-OUT

Speed 1/min : 225 (245)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 211.0...217.0  
1000 s: (208.0...220.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 92.0...94.0  
1000 s: (89.0...97.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 1125...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...160.0  
1000 s: (126.0...164.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...5.00  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (12.0...24.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : BAO 15,9 d  
 Edition : 21.08.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 920  
 Injection pump  
 Pump designation : PES6P12DA32ORS7241  
 EP type number : 0 412 726 854  
 Governor  
 Governor design. : RQV350...900PA935-1  
 Governor no. : 0 421 813 820

Customer-spec. information  
 Customer : BAUDOQUIN

Engine : 6P15 2E

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 074  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00

B04

Firing order : 1- 5- 3- 6- 2- 4  
 Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 12.00...12.10  
 Del.quantity cm<sup>3</sup>/ : 33.9...34.1  
 100 s: (33.6...34.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 4.5...4.9  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 945  
 travel mm : 8.40...8.60  
 2nd speed rpm : 350  
 travel mm : 1.30...1.70  
 3rd speed rpm : 550  
 travel mm : 3.60...4.20  
 4th speed rpm : 750  
 travel mm : 5.90...6.30  
 5th speed rpm : 1200  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 940  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Del.quantity : 339.0...341.0  
 1000 : (336.0...344.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 11.00  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.20  
Speed rpm : 350  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 350...450

START CUT-OUT

Speed 1/min : 270 (290)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 940...950

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 G 1
Edition : 26.07.91
Replaces : 05.07.91
Test oil : ISO-4113
Combination no. : 0 403 436 113
Injection pump
Pump designation : PES6MW100/320/3RS116
2
EP type number : 0 413 406 149
Governor
Governor design. : RQ300/1000MW117
Governor no. : 0 420 082 057

Customer-spec. information
Customer : MWM

Engine : TBD226B-6

1st version kW : 150.0
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10
: (3.95...4.15)

Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 14.4...14.6

100 s: (14.2...14.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.0...7.2

Del.quantity cm3/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1100

travel mm : 7.30...7.70

2nd speed rpm : 1000

travel mm : 5.90...6.10

3rd speed rpm : 370

travel mm : 4.70...5.30

4th speed rpm : 300

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 144.0...146.0

1000 : (142.0...148.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 91...99

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1040...1055  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.1

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 7.00...7.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.90...9.00

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 9.50...9.70  
2nd pressure hPa : 650  
Rack travel in m: 11.50...11.70  
3rd pressure hPa : 1200  
Rack travel in m: 12.40...12.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 143.5...146.5  
1000 s: (141.0...149.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 64.0...66.0  
1000 s: (62.0...68.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1040...1055

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.00...7.20  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 4,5 N  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 130  
 Injection pump  
 Pump designation : PES4MW100/320RS1220  
 EP type number : 0 413 404 116  
 Governor  
 Governor design. : RQV300...1200MW39-2  
 Governor no. : 0 420 083 059

Customer-spec. information  
 Customer : VME

Engine : TD45B  
 1st version kW : 82.5

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 173...176  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1-3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.20...12.30  
 Del.quantity cm3/ : 10.0...10.2  
 100 s: (9.8...10.4)  
 Spread cm3 : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del.quantity cm3/ : 1.3...1.7  
 100 s: (1.0...1.9)  
 Spread cm3 : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300  
 travel mm : 9.50...10.00  
 2nd speed rpm : 1250  
 travel mm : 8.80...9.00  
 3rd speed rpm : 380  
 travel mm : 1.50...2.10  
 4th speed rpm : 300  
 travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1200  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 100.0...102.0  
 1000 : (98.0...104.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

RATED SPEED

1st version



Control Lever  
position degrees: 100...108

Setting point:  
Speed rpm : 1200  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

#### START CUT-OUT

Speed 1/min : 220 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 101.0...105.0  
1000 s: (99.0...107.0)  
Spread cm<sup>3</sup> : 5.50  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)

#### LOW IDLE

B09

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 4,5 N1  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 403 444 131

Injection pump  
 Pump designation : PES4MM100/32ORS1220  
 EP type number : 0 413 404 116  
 Governor  
 Governor design. : RGV300...1100MW39-4  
 Governor no. : 0 420 083 067

Customer-spec. information  
 Customer : VME

Engine : TD45B  
 1st version kW : 82.5

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 173...176

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.70...11.80

Del. quantity cm<sup>3</sup>/ : 9.4...9.6  
 100 s : (9.2...9.8)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.5  
 Del. quantity cm<sup>3</sup>/ : 1.3...1.7  
 100 s : (1.0...1.9)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1220  
 travel mm : 9.20...9.60

2nd speed rpm : 1150  
 travel mm : 8.40...8.60

3rd speed rpm : 420  
 travel mm : 1.70...2.30

4th speed rpm : 300  
 travel mm : 1.00...1.40

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del. quantity : 94.0...96.0  
 1000 : (92.0...98.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 100...108

Setting point:  
Speed rpm : 1150  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

#### START CUT-OUT

Speed 1/min : 220 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1000  
Del.quantity cm3/ : 96.5...99.5  
1000 s: (94.0...102.0)  
Spread cm3 : 5.50  
1000 s: (7.0)  
Speed rpm : 900  
Del.quantity cm3/ : 95.5...98.5  
1000 s: (93.0...101.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.50  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : VOL 4,5 0  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 132  
 Injection pump  
 Pump designation : PES4MW100/320RS1222  
 EP type number : 0 413 404 117  
 Governor  
 Governor design. : RGV300...1100MW39-5  
 Governor no. : 0 420 083 068

Customer-spec. information  
 Customer : VME

Engine : TD45B

1st version kW : 88.5  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 173...176

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00

B12

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del.quantity cm<sup>3</sup>/ : 11.7...11.9

100 s: (11.5...12.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del.quantity cm<sup>3</sup>/ : 1.3...1.7  
 100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1225  
 travel mm : 9.40...9.80

2nd speed rpm : 1150  
 travel mm : 8.30...8.50

3rd speed rpm : 600  
 travel mm : 2.70...3.30

4th speed rpm : 300  
 travel mm : 1.00...1.40

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Del.quantity : 117.0...119.0  
 1000 : (115.0...121.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 100...108

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

#### START CUT-OUT

Speed 1/min : 220 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 115.5...118.5  
1000 s: (113.0...121.0)  
Spread cm<sup>3</sup> : 5.50  
1000 s: (7.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 100

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...160.0  
1000 s: (147.0...163.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

B13

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 I 3  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 133  
 Injection pump  
 Pump designation : PES4MW100/72ORS1212  
 EP type number : 0 413 404 114  
 Governor  
 Governor design. : RQV300...1300MW50-20  
 Governor no. : 0 420 083 252

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 364 LA

1st version kW : 99.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200  
 Rack travel in mm : 13.50...13.60  
 Del. quantity cm<sup>3</sup>/ : 9.8...10.0  
 100 s: (9.6...10.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.8...7.0  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.50...9.90  
 2nd speed rpm : 1340  
 travel mm : 8.50...8.70  
 3rd speed rpm : 500  
 travel mm : 2.70...3.30  
 4th speed rpm : 300  
 travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1340  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 700  
 Del. quantity : 98.0...100.0  
 1000 : (96.0...102.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 90...98

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.00...11.10

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.90...12.00  
2nd pressure hPa : 375  
Rack travel in m: 12.90...13.20  
3rd pressure hPa : 700  
Rack travel in m: 13.50...13.60

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 83.5...86.5  
1000 s: (81.0...89.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 40.0...42.0  
1000 s: (38.0...44.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 85.0...95.0  
1000 s: (82.0...98.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : FIA 8,1 D 1  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 284  
 Injection pump  
 Pump designation : PES6MW100/72ORS1197  
 EP type number : 0 413 406 185  
 Governor  
 Governor design. : RQV325...1250MW109-1  
 K  
 Governor no. : 0 420 083 995

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8060.45.6090  
 Rated speed : 2500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1250  
 Rack travel in mm : 14.50...14.60  
 Del.quantity cm<sup>3</sup>/ : 10.5...10.7  
 100 s : (10.3...10.9)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 325.0  
 Rack travel in mm : 7.5...7.7  
 Del.quantity cm<sup>3</sup>/ : 2.0...2.4  
 100 s : (1.7...2.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1400  
 travel mm : 10.00...10.40  
 2nd speed rpm : 825  
 travel mm : 4.90...5.10  
 3rd speed rpm : 400  
 travel mm : 2.90...3.50  
 4th speed rpm : 325  
 travel mm : 1.50...1.90

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1250  
 Aneroid pressure h : 1000  
 Del.quantity : 105.0...107.0  
 1000 : (103.0...109.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 112...120



Testing:  
1st rack travel in: 13.50  
Speed rpm : 1310...1320  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.6

Testing:  
Speed rpm : 200  
Minimum rack travel: 10.00  
Speed rpm : 325  
Rack travel in mm : 7.50...7.70

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 1100  
Rack travel in m: 14.20...14.40  
3rd speed rpm : 900  
Rack travel in m: 13.60...13.80  
4th speed rpm : 600  
Rack travel in m: 13.50...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.40...10.50

Measurement  
Speed 1/min : 500

1st pressure hPa : 450  
Rack travel in m: 11.40...11.50  
2nd pressure hPa : 700  
Rack travel in m: 12.80...13.10  
3rd pressure hPa : 1000  
Rack travel in m: 13.50...13.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1100

Del.quantity cm3/ : 108.0...111.0  
1000 s: (105.5...113.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 900  
Del.quantity cm3/ : 105.5...108.5  
1000 s: (103.0...111.0)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 115.5...118.5  
1000 s: (113.0...121.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 65.5...67.5  
1000 s: (63.5...69.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 1310...1320

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 65.0...85.0  
1000 s: (62.0...88.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 7.50...7.70  
Del.quantity cm3/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 4,5 Q  
Edition : 02.08.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 287  
Injection pump  
Pump designation : PES6MM100/32ORS1219  
EP type number : 0 413 406 209  
Governor  
Governor design. : RQV350...1100MW118  
Governor no. : 0 420 083 249

Customer-spec. information  
Customer : VME

Engine : TD 61 GB  
1st version kW : 115.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 457 413 047  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100  
Rack travel in mm : 11.40...11.50  
Del.quantity cm<sup>3</sup>/ : 10.9...11.1  
100 s: (10.7...11.3)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

2nd speed rpm : 350.0  
Rack travel in mm : 6.3...6.5  
Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
100 s: (1.3...2.2)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1210  
travel mm : 9.50...9.90  
2nd speed rpm : 1150  
travel mm : 8.70...8.90  
3rd speed rpm : 725  
travel mm : 3.70...4.30  
4th speed rpm : 350  
travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1000  
Del.quantity : 109.0...111.0  
1000 : (107.0...113.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 96...104

Testing:  
1st rack travel in: 10.40

Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1300  
Speed rpm : 0.10...1.00

#### LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.4

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 350  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 460...520

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.40...11.40  
2nd speed rpm : 700  
Rack travel in m: 12.40...12.50  
3rd speed rpm : 900  
Rack travel in m: 11.90...12.20

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 700  
Pressure hPa : 450  
Rack travel mm : 11.80...11.90

#### Measurement

Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 230  
Rack travel in m: 10.70...11.00  
3rd pressure hPa : 1000  
Rack travel in m: 12.40...12.50

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 700

Del.quantity cm3/ : 120.5...123.5  
1000 s: (118.0...126.0)  
Spread cm3 : 3.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 82.0...84.0  
1000 s: (80.0...86.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 100

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (87.0...113.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : IHC 7,6 X 4  
 Edition : 23.08.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 288  
 Injection pump  
 Pump designation : PES6MM100/32ORS1189  
 EP type number : 0 413 406 177  
 Governor  
 Governor design. : RQV350...1200MW46-41  
 Governor no. : 0 420 083 250

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 186.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038  
 Inlet press., bar : 2.80  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 800  
 Rack travel in mm : 14.00...14.10  
 Del.quantity cm<sup>3</sup>/ : 15.2...15.4  
 100 s : (15.0...15.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s : (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.80...10.20  
 2nd speed rpm : 1250  
 travel mm : 7.90...8.10  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 1200  
 Del.quantity : 152.0...154.0  
 1000 : (150.0...156.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control Lever  
position degrees: 100...108

Testing:

1st rack travel in: 13.00  
Speed rpm : 1280...1300  
2nd rack travel in: 4.00  
Speed rpm : 1435...1445  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.10

Measurement

Speed 1/min : 500

1st pressure hPa : 245  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 560  
Rack travel in m: 12.80...13.20  
3rd pressure hPa : 1200  
Rack travel in m: 14.00...14.10

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 140.0...144.0  
1000 s: (138.0...146.0)

Spread cm<sup>3</sup> : 6.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 77.0...79.0  
1000 s: (75.0...81.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1280...1300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1816730C92  
In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,1 B 6  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 289  
 Injection pump  
 Pump designation : PES6MW100/720RS1131-1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQV300...1300MW50-21  
 Governor no. : 0 420 083 253

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 177.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)

Rack travel in mm : 9.00...12.00  
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300

Rack travel in mm : 14.40...14.50

Del. quantity cm<sup>3</sup>/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del. quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.00...9.40

2nd speed rpm : 1350  
 travel mm : 8.10...8.30

3rd speed rpm : 650  
 travel mm : 4.70...5.30

4th speed rpm : 300  
 travel mm : 1.20...1.60

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1350  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1000  
 Del. quantity : 114.0...116.0  
 1000 : (112.0...118.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1480...1510  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.60...10.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 400  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.50

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 41.0...43.0  
1000 s: (39.0...45.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 7,2 V  
 Edition : 21.08.91  
 Replaces : 06.91  
 Test oil : ISO-4113

Combination no. : 0 403 456 110

Injection pump  
 Pump designation : PES6MW100/321RS1201  
 EP type number : 0 413 406 190  
 Governor  
 Governor design. : RQ250/1200MW84-3  
 Governor no. : 0 420 082 043

Cust. part no. : 3-7035

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LFO2

1st version kW : 169.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 15.00...0.00  
 Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1300  
 travel mm : 8.40...8.80

2nd speed rpm : 1260  
 travel mm : 6.60...6.80

3rd speed rpm : 345  
 travel mm : 4.00...4.60

4th speed rpm : 250  
 travel mm : 1.80...2.20

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: 107

Speed rpm : 600

Rack travel in mm : 18.20...19.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)



Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 92...100

Setting point:  
Speed rpm : 600  
Rack travel in mm : 19.0

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 600  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 800  
Rack travel in m: 12.70...12.90  
4th speed rpm : 1200  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 170  
Rack travel mm : 10.20...10.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10

2nd pressure hPa : 550  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 1000  
Rack travel in m: 12.70...12.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 137.0...140.0  
1000 s: (134.5...142.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 140.0...143.0  
1000 s: (137.5...145.5)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 134.5...137.5  
1000 s: (132.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 5.00  
1000 s: (7.00)

Remarks:  
: MAN #3-7047  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 7,3 D  
 Edition : 02.08.91  
 Replaces : 05.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 115  
 Injection pump  
 Pump designation : PES6MM100/321RS1215  
 EP type number : 0 413 406 205  
 Governor  
 Governor design. : RQ250/1200MM84-7  
 Governor no. : 0 420 082 055

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LUH 01  
 1st version kW : 199.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32  
 Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000  
 Rack travel in mm : 13.60...13.70  
 Del.quantity cm<sup>3</sup>/ : 16.3...16.5  
 100 s: (16.1...16.7)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 6.2...6.4  
 Del.quantity cm<sup>3</sup>/ : 2.1...2.5  
 100 s: (1.8...2.7)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1320  
 travel mm : 9.30...9.70  
 2nd speed rpm : 1255  
 travel mm : 6.50...6.70  
 3rd speed rpm : 360  
 travel mm : 3.90...4.50  
 4th speed rpm : 250  
 travel mm : 1.60...2.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: 107  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1200  
 Del.quantity : 163.0...165.0  
 1000 : (161.0...167.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 94...102

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.60  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 32...40  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.3

Testing:  
Speed rpm : 150  
Minimum rack trave: 8.00  
Speed rpm : 250  
Rack travel in mm : 6.20...6.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 200  
Rack travel mm : 10.00...10.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 700  
Rack travel in m: 12.40...12.70  
3rd pressure hPa : 1200  
Rack travel in m: 13.60...13.70

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 167.0...170.0  
1000 s: (164.5...172.5)

Spread cm<sup>2</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 163.0...166.0  
1000 s: (160.5...168.5)  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 160.0...163.0  
1000 s: (157.5...165.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 77.0...79.0  
1000 s: (75.0...81.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 70.0...90.0  
1000 s: (67.0...93.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.20...6.40  
Del.quantity cm<sup>3</sup>/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7126  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 7,3 D 1  
 Edition : 02.08.91  
 Replaces : 06.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 116  
 Injection pump  
 Pump designation : PES6MM100/321RS1215  
 EP type number : 0 413 406 205  
 Governor  
 Governor design. : RQ250/1200MM84-7  
 Governor no. : 0 420 082 055

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LUH 04

1st version kW : 199.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 16.3...16.5

100 s: (16.1...16.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 6.2...6.4

Del.quantity cm<sup>3</sup>/ : 2.1...2.5

100 s: (1.8...2.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1320

travel mm : 9.30...9.70

2nd speed rpm : 1255

travel mm : 6.50...6.70

3rd speed rpm : 360

travel mm : 3.90...4.50

4th speed rpm : 250

travel mm : 1.60...2.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: 107

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (161.0...167.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control Lever  
position degrees: 94...102

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.60  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 32...40  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.3

Testing:  
Speed rpm : 150  
Minimum rack trave: 8.00  
Speed rpm : 250  
Rack travel in mm : 6.20...6.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 200  
Rack travel mm : 10.00...10.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 700  
Rack travel in m: 12.40...12.70  
3rd pressure hPa : 1200  
Rack travel in m: 13.60...13.70

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 167.0...170.0  
1000 s: (164.5...172.5)

Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 163.0...166.0  
1000 s: (160.5...168.5)  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 160.0...163.0  
1000 s: (157.5...165.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 77.0...79.0  
1000 s: (75.0...81.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 70.0...90.0  
1000 s: (67.0...93.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.20...6.40  
Del.quantity cm3/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: MAN #3-7137  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 7,3 D 2  
 Edition : 02.08.91  
 Replaces : 06.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 117  
 Injection pump  
 Pump designation : PES6MW100/321RS1215  
 EP type number : 0 413 406 205  
 Governor  
 Governor design. : RQV250...1200MW83-2  
 Governor no. : 0 420 083 216

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LF 04

1st version kW : 199.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00

CO2

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 16.3...16.5

100 s: (16.1...16.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 6.2...6.4

Del.quantity cm<sup>3</sup>/ : 2.1...2.5

100 s: (1.8...2.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1250  
 travel mm : 10.60...11.00

2nd speed rpm : 800  
 travel mm : 5.90...6.10

3rd speed rpm : 450  
 travel mm : 3.20...3.80

4th speed rpm : 250  
 travel mm : 1.20...1.60

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1200

Del.quantity : 163.0...165.0  
 1000 : (161.0...167.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 300...308

Testing:  
1st rack travel in: 12.60  
Speed rpm : 1250...1260  
2nd rack travel in: 4.00  
Speed rpm : 1320...1350  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 256...264  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.3

Testing:  
Speed rpm : 150  
Minimum rack travel: 8.00  
Speed rpm : 250  
Rack travel in mm : 6.20...6.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 200  
Rack travel mm : 10.00...10.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 700  
Rack travel in m: 12.40...12.70  
3rd pressure hPa : 1200  
Rack travel in m: 13.60...13.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 167.0...170.0  
1000 s: (164.5...172.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 163.0...166.0  
1000 s: (160.5...168.5)  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 160.0...163.0  
1000 s: (157.5...165.5)  
Aneroid pressure h: -

C03

Speed rpm : 500  
Del.quantity cm3/ : 77.0...79.0  
1000 s: (75.0...81.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 1250...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 70.0...90.0  
1000 s: (67.0...93.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.20...6.40  
Del.quantity cm3/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks: : MAN #3-7138

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 G  
 Edition : 02.08.91  
 Replaces : 05.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 466 108  
 Injection pump  
 Pump designation : PES6MW100/320/3RS116  
 2  
 EP type number : 0 413 406 149  
 Governor  
 Governor design. : RSV325...1200MWOA326  
 Governor no. : 0 420 085 085

Customer-spec. information  
 Customer : MWM

Engine : TD 226 B-6

1st version kW : 136.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.40...10.50

Del. quantity cm<sup>3</sup>/ : 11.6...11.8

100 s: (11.4...12.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 6.5...6.7

Del. quantity cm<sup>3</sup>/ : 0.8...1.2

100 s: (0.6...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del. quantity : 116.5...118.5

1000 : (114.5...120.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:



1st rack travel in: 9.40  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1260...1300  
3rd rack travel in: 4.00  
Speed rpm : 1295...1325  
4th rack travel in: 1380  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 325  
Rack travel in mm : 6.50...6.70

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 750  
Rack travel in m: 10.70...10.80  
3rd speed rpm : 500  
Rack travel in m: 10.70...10.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.50...8.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : 270  
Rack travel in m: 9.10...9.20  
2nd pressure hPa : 450  
Rack travel in m: 9.90...10.20  
3rd pressure hPa : 700  
Rack travel in m: 10.70...10.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 116.5...119.5  
1000 s: (114.0...122.0)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 62.5...64.5  
1000 s: (60.5...66.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0  
1000 s: (97.0...123.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.50...6.70  
Del.quantity cm<sup>3</sup>/ : 8.0...12.0  
1000 s: (6.0...14.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Test electrically-released starting  
quantity (EES) with 12 volts

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 4,5 P  
Edition : 26.07.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 474 015  
  
Injection pump  
Pump designation : PES4MM100/32ORS1221  
EP type number : 0 413 404 115  
Governor  
Governor design. : RSV300...1000MW1A315  
-1  
Governor no. : 0 420 085 099

Customer-spec. information  
Customer : VME

Engine : TD45B

1st version kW : 84.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
: (2.75...2.95)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.40...12.50

Del. quantity cm<sup>3</sup>/ : 10.5...10.7

100 s: (10.3...10.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.2...8.4

Del. quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del. quantity : 105.0...107.0

1000 : (103.0...109.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.40

Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
3rd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.7

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 7.60...7.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1000  
Del.quantity cm3/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Spread cm3 : 5.50  
1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 8.20...8.40  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 I 2  
Edition : 26.07.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 474 016  
  
Injection pump  
Pump designation : PES4MM100/72ORS1212  
EP type number : 0 413 404 114  
Governor  
Governor design. : RSV350...1300MWA346  
Governor no. : 0 420 085 175

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364LA

1st version kW : 102.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
                  : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.20...13.30

Del.quantity cm<sup>3</sup>/ : 10.1...10.3

100 s : (9.9...10.5)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.8

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s : (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.10...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 102...110

Setting point:

Speed rpm : 800

Rack travel in mm : 0.5

Testing:

1st rack travel in: 12.20

Speed rpm : 1340...1345 \*  
2nd rack travel in: 4.00  
Speed rpm : 1380...1393  
3rd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70  
5th rack travel in: 1345...1360  
Speed rpm : 12.20

LOW IDLE 1

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 400  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 700  
Rack travel in m: 13.20...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 36.0...38.0  
1000 s: (34.0...40.0)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)

LOW IDLE

C09

Speed rpm : 350  
Rack travel in mm : 6.00...6.80  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

\* Read off speed set under 1.  
Add 40...48 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 4,0 K  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 474 017  
 Injection pump  
 Pump designation : PES4MW100/72ORS1212-  
 1  
 EP type number : 0 413 404 118  
 Governor  
 Governor design. : RSV350...1300MWOA346  
 -1  
 Governor no. : 0 420 085 176

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM364LA

1st version kW : 102.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300  
 Rack travel in mm : 13.20...13.30  
 Del.quantity cm<sup>3</sup>/ : 10.1...10.3  
 100 s: (9.9...10.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 6.0...6.8  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.10...1.00

Governor spring pre-tension  
 Click setting x : 4.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del.quantity : 101.0...103.0  
 1000 : (99.0...105.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 102...110

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.5

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1340...1345 \*  
2nd rack travel in: 4.00  
Speed rpm : 1380...1393  
3rd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70  
5th rack travel in: 1345...1360  
Speed rpm : 12.20

#### LOW IDLE 1

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.20

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 400  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 700  
Rack travel in m: 13.20...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 36.0...38.0  
1000 s: (34.0...40.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del. quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.80  
Del. quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

\* Read off speed set under 1.  
Add 40...48 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 H 6  
 Edition : 26.07.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 474 018  
 Injection pump  
 Pump designation : PES4MM100/72ORS1151  
 EP type number : 0 413 404 104  
 Governor  
 Governor design. : RSV350...1300MWOA346  
 -2  
 Governor no. : 0 420 085 177  
 Customer-spec. information  
 Customer : MB-NFZ  
 Engine : OM364A  
 1st version kW : 79.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 10.80...10.90  
 Del.quantity cm<sup>3</sup>/ : 8.2...8.4  
 100 s: (8.0...8.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 6.0...6.8  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del.quantity : 82.0...84.0  
 1000 : (80.0...86.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 100...108  
 Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.80  
 Speed rpm : 1340...1345 \*  
 2nd rack travel in: 4.00



Speed rpm : 1380...1393  
3rd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1550  
Speed rpm : 0.30...1.70  
5th rack travel in: 1340...1350  
Speed rpm : 9.80

#### LOW IDLE 1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Rack travel in mm : 2.00  
Speed rpm : 420...500

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.90...12.00  
3rd speed rpm : 1000  
Rack travel in m: 11.90...12.00  
4th speed rpm : 1175  
Rack travel in m: 11.30...11.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.10

#### Measurement

Speed 1/min : 500  
1st pressure hPa : 200  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 300  
Rack travel in m: 11.20...11.40  
3rd pressure hPa : 700  
Rack travel in m: 11.90...12.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 75.0...78.0  
1000 s: (72.5...80.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 46.0...48.0  
1000 s: (44.0...50.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.80  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:  
\* Read off speed set under 1.  
Add 40...48 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 8,4 D  
 Edition : 26.07.91  
 Replaces : 06.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 081  
 Injection pump  
 Pump designation : PES6MM100/72ORS1196  
 EP type number : 0 413 406 184  
 Governor  
 Governor design. : RSV350...1050MWOA338  
 Governor no. : 0 420 085 138

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 916 T

1st version kW : 170.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 049  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50  
 : (3.35...3.55)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 11.10...11.20  
 Del. quantity cm<sup>3</sup>/ : 13.3...13.5  
 100 s: (13.1...13.7)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 6.0...6.4  
 Del. quantity cm<sup>3</sup>/ : 2.7...3.1  
 100 s: (2.4...3.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 750  
 Del. quantity : 133.0...135.0  
 1000 : (131.0...137.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 98...106

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 10.10

Speed rpm : 1060...1075  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
3rd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 70...70

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 550  
Pressure hPa : -  
Rack travel mm : 10.40...10.60

Measurement  
Speed 1/min : 550

1st pressure hPa : 350  
Rack travel in m: 10.80...11.00  
2nd pressure hPa : 750  
Rack travel in m: 11.10...11.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 750  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 132.5...135.5  
1000 s: (130.0...138.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 750  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 133.5...136.5  
1000 s: (131.0...139.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 120.0...122.0  
1000 s: (118.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10

C15

Speed rpm : 1060...1075

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.40  
Del.quantity cm<sup>3</sup>/ : 27.0...31.0  
1000 s: (24.5...33.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 92  
 Edition : 26.07.91  
 Replaces : 02.91  
 Test oil : ISO-4113

Combination no. : 0 403 476 088

Injection pump  
 Pump designation : PES6MW100/72ORS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RSV350...1300MWOA341  
 -1  
 Governor no. : 0 420 085 146

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

---

Rack travel in mm : 10.70...10.80

---

Del. quantity cm<sup>3</sup>/ : 7.2...7.4

---

100 s: (7.0...7.6)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.6)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 7.0...7.6  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Del. quantity : 72.0...74.0  
 1000 : (70.0...76.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 100...108

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 9.70

Speed rpm : 1340...1345 \*  
2nd rack travel in: 4.00  
Speed rpm : 1380...1393  
3rd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70  
5th rack travel in: 1345...1360  
Speed rpm : 9.70

LOW IDLE 1

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Rack travel in mm : 2.00  
Speed rpm : 445...505

TORQUE CONTROL

Dimension a mm : 1.30  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 700  
Rack travel in m: 11.90...12.00  
3rd speed rpm : 825  
Rack travel in m: 11.60...11.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 69.0...71.0  
1000 s: (67.0...73.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Speed rpm : 825  
Del.quantity cm<sup>3</sup>/ : 73.0...76.0  
1000 s: (70.5...78.5)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.00...7.60  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

\* Read off speed set under 1.  
Add 40...48 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 93  
 Edition : 26.07.91  
 Replaces : 02.91  
 Test oil : ISO-4113

Combination no. : 0 403 476 089

Injection pump  
 Pump designation : PES6MM100/720RS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RSV350...1200MWOA341  
 -2  
 Governor no. : 0 420 085 147

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 115.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 8.0...8.2

100 s : (7.8...8.4)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.0...7.6

Del.quantity cm<sup>3</sup>/ : 0.9...1.1

100 s : (0.6...1.4)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 80.5...82.5

1000 : (78.5...84.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 99...107

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.00

Speed rpm : 1240...1245 \*  
2nd rack travel in: 4.00  
Speed rpm : 1285...1298  
3rd rack travel in: 4.00  
Speed rpm : 1325...1355  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1240...1255  
Speed rpm : 11.00

#### LOW IDLE 1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Rack travel in mm : 2.00  
Speed rpm : 445...505

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 750  
Rack travel in m: 12.50...12.60  
3rd speed rpm : 1000  
Rack travel in m: 12.10...12.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 74.5...76.5  
1000 s: (72.5...78.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.00...7.60  
Del.quantity cm<sup>3</sup>/ : 9.0...11.0  
1000 s: (6.0...14.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:

\* Read off speed set under 1.

Add 45...53 min<sup>-1</sup> to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 94  
 Edition : 26.07.91  
 Replaces : 02.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 090  
 Injection pump  
 Pump designation : PES6MW100/72ORS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RSV350...1200MW1A341  
 -3  
 Governor no. : 0 420 085 148

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 92.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200  
 Rack travel in mm : 9.80...9.90  
 Del. quantity cm<sup>3</sup>/ : 6.2...6.4  
 100 s : (6.0...6.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 7.0...7.6  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s : (0.6...1.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1200  
 Del. quantity : 62.0...64.0  
 1000 : (60.0...66.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 98...106

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 8.80



Speed rpm : 1235...1240 \*  
2nd rack travel in: 4.00  
Speed rpm : 1270...1283  
3rd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1245...1260  
Speed rpm : 8.80

#### LOW IDLE 1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Rack travel in mm : 2.00  
Speed rpm : 415...475

#### TORQUE CONTROL

Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 800  
Rack travel in m: 10.50...10.60  
3rd speed rpm : 950  
Rack travel in m: 10.10...10.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 60.5...63.5  
1000 s: (58.0...66.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.00...7.60  
Del. quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

\* Read off speed set under 1.  
Add 35...43 min<sup>-1</sup> to this speed. The

control-rod travel under 2. must be attained with the calculated speed profile.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 95  
 Edition : 26.07.91  
 Replaces : 02.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 091  
 Injection pump  
 Pump designation : PES6MW100/72ORS1131  
 EP type number : 0 413 406 123  
 Governor  
 Governor design. : RSV350...1300MWOA342  
 Governor no. : 0 420 085 149

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 150.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00x1.50x600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.60...12.70

Del.quantity cm<sup>3</sup>/ : 10.0...10.2

100 s: (9.8...10.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.2...6.9

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 100.0...102.0

1000 : (98.0...104.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.60

Speed rpm : 1340...1345 \*  
2nd rack travel in: 4.00  
Speed rpm : 1387...1400  
3rd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1600  
Speed rpm : 0.30...1.70  
5th rack travel in: 1345...1355  
Speed rpm : 11.60

#### LOW IDLE 1

##### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Rack travel in mm : 2.00  
Speed rpm : 420...480

Aneroid/Altitude  
Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.70...10.80

##### Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 11.30...11.40  
2nd pressure hPa : 400  
Rack travel in m: 12.10...12.40  
3rd pressure hPa : 1000  
Rack travel in m: 12.60...12.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 86.5...89.5  
1000 s: (84.0...92.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 53.0...55.0  
1000 s: (51.0...57.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 83.0...93.0  
1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.20...6.90  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

\* Read off speed set under 1.  
Add 47...55 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 D 96  
 Edition : 26.07.91  
 Replaces : 02.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 092  
 Injection pump  
 Pump designation : PES6MW100/720RS1120  
 EP type number : 0 413 406 112  
 Governor  
 Governor design. : RSV350...1300MWA342  
 -1  
 Governor no. : 0 420 085 150

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 142.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300

Rack travel in mm : 13.00...13.10

Del.quantity cm<sup>3</sup>/ : 9.5...9.7

100 s: (9.3...9.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.2...6.9

Del.quantity cm<sup>3</sup>/ : 1.0...1.2

100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 95.0...97.0

1000 : (93.0...99.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version

Control lever

position degrees: 106...114

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 12.00

Speed rpm : 1340...1345 \*

2nd rack travel in: 4.00

Speed rpm : 1397...1410  
3rd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1600  
Speed rpm : 0.30...1.70  
5th rack travel in: 1335...1350  
Speed rpm : 12.00

#### LOW IDLE 1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Rack travel in mm : 2.00  
Speed rpm : 420...480

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.60...11.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 12.10...12.20  
2nd pressure hPa : 360  
Rack travel in m: 12.60...12.90  
3rd pressure hPa : 1000  
Rack travel in m: 13.00...13.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 83.0...86.0  
1000 s: (80.5...88.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 50.0...52.0  
1000 s: (48.0...54.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (92.0...98.0)

#### LOW IDLE

C25

Speed rpm : 350  
Rack travel in mm : 6.20...6.90  
Del.quantity cm<sup>3</sup>/ : 10.0...12.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

#### Remarks:

\* Read off speed set under 1.  
Add 57...65 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.  
Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,1 B  
 Edition : 26.07.91  
 Replaces : 02.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 097  
 Injection pump  
 Pump designation : PES6MW100/72ORS1131-  
 1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RSV350...1300MWA342  
 -2  
 Governor no. : 0 420 085 157

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 177.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 15.60...15.70  
 Del.quantity cm<sup>3</sup>/ : 12.0...12.2  
 100 s: (11.8...12.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 7.0...7.8  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.2  
 100 s: (0.6...1.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1000  
 Del.quantity : 120.0...122.0  
 1000 : (118.0...124.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 103...111

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 14.60

Speed rpm : 1340...1345 \*  
2nd rack travel in: 4.00  
Speed rpm : 1432...1445  
3rd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1600  
Speed rpm : 0.30...1.70  
5th rack travel in: 1340...1350  
Speed rpm : 14.60

#### LOW IDLE 1

##### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Rack travel in mm : 2.00  
Speed rpm : 430...490

##### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.70...10.80

##### Measurement

Speed 1/min : 500

1st pressure hPa : 270  
Rack travel in m: 12.60...12.70  
2nd pressure hPa : 500  
Rack travel in m: 14.30...14.60  
3rd pressure hPa : 1000  
Rack travel in m: 15.60...15.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 109.0...111.0  
1000 s: (106.5...114.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 31.0...33.0  
1000 s: (29.0...35.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.00...7.80  
Del.quantity cm<sup>3</sup>/ : 10.0...12.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

\* Read off speed set under 1.  
Add 92...100 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.  
Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,1 D 6  
 Edition : 26.07.91  
 Replaces : 03.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 104  
 Injection pump  
 Pump designation : PES6MW100/72ORS1131  
 EP type number : 0 413 406 123  
 Governor  
 Governor design. : RSV350...1200MWOA342  
 -7  
 Governor no. : 0 420 085 170  
 Customer-spec. information  
 Customer : MB-NFZ  
 Engine : OM 366 A  
 1st version kW : 100.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200  
 Rack travel in mm : 10.50...10.60  
 Del. quantity cm<sup>3</sup>/ : 7.4...7.6  
 100 s : (7.2...7.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 5.8...6.5  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s : (0.6...1.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 750  
 Del. quantity : 74.0...76.0  
 1000 : (72.0...78.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 96...104

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:



1st rack travel in: 9.50  
Speed rpm : 1240...1245 \*  
2nd rack travel in: 4.00  
Speed rpm : 1280...1293  
3rd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 14.50  
Speed rpm : 0.30...1.70  
5th rack travel in: 1240...1255  
Speed rpm : 9.50

#### LOW IDLE 1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Rack travel in mm : 2.00  
Speed rpm : 450...530

#### TORQUE CONTROL

Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 600  
Rack travel in m: 11.30...11.40  
3rd speed rpm : 1000  
Rack travel in m: 10.90...11.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.10

#### Measurement

Speed 1/min : 500  
1st pressure hPa : 250  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 300  
Rack travel in m: 10.90...11.10  
3rd pressure hPa : 750  
Rack travel in m: 11.30...11.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 750  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 67.0...70.0  
1000 s: (64.5...72.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

D01

Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 47.0...49.0  
1000 s: (45.0...51.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 83.0...93.0  
1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.50  
Del. quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:

\* Read off speed set under 1.  
Add 40...48 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.  
Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,1 D 7  
Edition : 26.07.91  
Replaces : 04.91  
Test oil : ISO-4113

Combination no. : 0 403 476 105

Injection pump  
Pump designation : PES6MM100/72ORS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RSV350...1200MWA342  
-8  
Governor no. : 0 420 085 171

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 114.0  
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.90...11.00

Del.quantity cm3/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.5

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 750

Del.quantity : 84.0...88.0

1000 : (82.0...88.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever  
position degrees: 100...108

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.90  
Speed rpm : 1240...1245 \*  
2nd rack travel in: 4.00  
Speed rpm : 1285...1298  
3rd rack travel in: 4.00  
Speed rpm : 1325...1355  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70  
5th rack travel in: 1240...1255  
Speed rpm : 9.90

#### LOW IDLE 1

##### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Rack travel in mm : 2.00  
Speed rpm : 420...500

#### TORQUE CONTROL

##### Torque control curve - 1st version

1st speed rpm : 1200  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 600  
Rack travel in m: 11.70...11.80  
3rd speed rpm : 1000  
Rack travel in m: 11.00...11.20

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.60...9.70

##### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 400  
Rack travel in m: 11.30...11.50  
3rd pressure hPa : 750  
Rack travel in m: 11.70...11.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 750  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 78.0...81.0  
1000 s: (75.5...83.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500

D03

Del. quantity cm<sup>3</sup>/ : 47.0...49.0  
1000 s: (45.0...51.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 83.0...93.0  
1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.50  
Del. quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:

\* Read off speed set under 1.  
Add 45...53 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.  
Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,1 D 8  
 Edition : 26.07.91  
 Replaces : 03.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 107  
 Injection pump  
 Pump designation : PES6MW100/720RS1131  
 EP type number : 0 413 406 123  
 Governor  
 Governor design. : RSV350...1300MWA342  
 -5  
 Govenor no. : 0 420 085 172

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 122.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.90...11.00

Del.quantity cm<sup>3</sup>/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.5

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 750

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.90  
Speed rpm : 1340...1345 \*  
2nd rack travel in: 4.00  
Speed rpm : 1380...1393  
3rd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1550  
Speed rpm : 0.30...1.70  
5th rack travel in: 1345...1360  
Speed rpm : 9.90

#### LOW IDLE 1

##### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Rack travel in mm : 2.00  
Speed rpm : 420...500

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 600  
Rack travel in m: 11.70...11.80  
3rd speed rpm : 1100  
Rack travel in m: 11.00...11.20

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.40

##### Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 400  
Rack travel in m: 11.30...11.50  
3rd pressure hPa : 750  
Rack travel in m: 11.70...11.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 750  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 78.0...81.0  
1000 s: (75.5...83.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del. quantity cm<sup>3</sup>/ : 47.0...49.0  
1000 s: (45.0...51.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 83.0...93.0  
1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.50  
Del. quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

\* Read off speed set under 1.  
Add 40...48 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.  
Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 u  
 Edition : 02.08.91  
 Replaces : 16.1.91  
 Test oil : ISO-4113  
 Combination no. : 9 400 087 449  
 Injection pump  
 Pump designation : PES6P120A320RS3264  
 EP type number : 9 400 087 075  
 Governor  
 Governor design. : RQV350...1100PA973  
 Governor no. : 9 420 080 293

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CTAA - 8.3 l

1st version kW : 216.6  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.45...3.55  
 : (3.40...3.60)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.5...1.1

100 s: (0.3...1.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.8)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1150

travel mm : 7.00...7.10

2nd speed rpm : 350

travel mm : 1.40...1.80

3rd speed rpm : 650

travel mm : 4.30...4.70

4th speed rpm : 1400

travel mm : 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1325

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 199.0...201.0

1000 : (196.0...204.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 106...114

#### Testing:

1st rack travel in: 10.50  
Speed rpm : 1160...1170  
2nd rack travel in: 4.00  
Speed rpm : 1330...1360  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 66...74

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

#### CONSTANT REGULATION

Speed rpm : 425...575

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 11.50...11.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 480  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 800  
Rack travel in m: 10.70...11.00

#### START CUT-OUT

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700

007

Del.quantity cm3/ : 204.0...208.0  
1000 s: (200.5...211.5)

Spread cm3 : 6.00  
1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 116.0...119.0  
1000 s: (114.0...121.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 235.0...265.0  
1000 s: (231.0...269.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 5.0...11.0  
1000 s: (3.0...13.0)  
Spread cm3 : 5.00  
1000 s: (8.00)

Remarks:

:  
Start-of-delivery mark is at 8° after  
start of delivery.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,3 F
Edition : 14.10.91
Replaces : 24.02.89
Test oil : ISO-4113
Combination no. : 0 400 074 087
Injection pump
Pump designation : PES4M55C32ORS175
EP type number : 0 410 054 957
Governor
Governor design. : RSV350...1650MOC353-7
Governor no. : 0 420 033 043

Customer-spec. information
Customer : MB-NFZ

Engine : OM601 (2,3L)
1st version kW : 51.0

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 469 990 351
Inlet press., bar : 1.00
Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
Prestroke mm : 2.00...2.10
: (1.95...2.15)
Rack travel in mm : 20.00...22.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1630

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 4.0...4.1

100 s: (3.9...4.2)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 0.5...0.7

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1630

Del.quantity : 40.0...41.0

1000 : (39.0...42.0)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 57...65

Testing:

1st rack travel in: 11,2

Speed rpm : 1670...1680

2nd rack travel in: 4.00

Speed rpm : 1775...1793

4th rack travel in: 2000

Speed rpm : 0.30...1.70



LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack trave: 20.10  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1630  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 1000  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 1400  
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1000  
Del.quantity cm3/ : 38.5...40.0  
1000 s: (37.5...41.0)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Speed rpm : 1400  
Del.quantity cm3/ : 38.5...40.5  
1000 s: (37.5...41.5)  
Spread cm3 : 2.50  
1000 s: (3.00)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.2  
Speed rpm : 1670...1680

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

LOW IDLE

Speed rpm : 350

D09

Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.0...7.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

Remarks:

:  
Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,3 G1  
 Edition : 15.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 074 088  
 Injection pump  
 Pump designation : PES4M55C32ORS175  
 EP type number : 0 410 054 957  
 Governor  
 Governor design. : RSV400...2000MOC353-  
 8  
 Governor no. : 0 420 033 044

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM601 (2,3L)

1st version kW : 58.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 20.00...22.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1980

Rack travel in mm : 11.90...12.00

Del.quantity cm<sup>3</sup>/ : 4.0...4.1

100 s: (3.9...4.2)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 400.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.7

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1980

Del.quantity : 40.0...41.0

1000 : (39.0...42.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control Lever

position degrees: 41...49

Testing:

1st rack travel in: 11.0

Speed rpm : 2020...2030

2nd rack travel in: 4.00

Speed rpm : 2130...2148

4th rack travel in: 2250

Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack trave: 20.10  
Speed rpm : 400  
Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1980  
Rack travel in m: 11.90...12.00  
2nd speed rpm : 500  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 1250  
Rack travel in m: 12.70...12.90  
4th speed rpm : 1500  
Rack travel in m: 12.40...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm3/ : 37.0...38.5  
1000 s: (36.0...39.5)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Speed rpm : 1250  
Del.quantity cm3/ : 39.0...41.0  
1000 s: (38.0...42.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.0...7.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

Remarks:

:  
Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,3 n  
 Edition : 15.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 074 089  
 Injection pump  
 Pump designation : PES4M55C32ORS175  
 EP type number : 0 410 054 957  
 Governor  
 Governor design. : RSV350...1500MOC353-10  
 Governor no. : 0 420 033 039

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM601 (2,3L)

1st version kW : 44.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1480

Rack travel in mm : 11.70...11.80

Del.quantity cm<sup>3</sup>/ : 3.7...3.8

100 s: (3.6...3.9)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.7

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1480

Del.quantity : 37.5...38.5

1000 : (36.5...39.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: -

Testing:

1st rack travel in: 10.60

Speed rpm : 1520...1530

2nd rack travel in: 4.00

Speed rpm : 1610...1628

4th rack travel in: 1750

Speed rpm : 0.30...1.70

LOW IDLE 1  
Control Lever  
position degrees: -  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 100  
Minimum rack trave: 20.10  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1480  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 1100  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 1350  
Rack travel in m: 12.10...12.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1100  
Del.quantity cm3/ : 39.0...40.0  
1000 s: (38.0...41.0)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Speed rpm : 1350  
Del.quantity cm3/ : 38.5...40.0  
1000 s: (37.5...41.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.80  
Speed rpm : 1520...1530

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.0...7.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

Remarks:

:  
Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,3 n1  
 Edition : 15.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 074 089  
 Injection pump  
 Pump designation : PES4M55C32ORS175  
 EP type number : 0 410 054 957  
 Governor  
 Governor design. : RSV350...1500MOC353-  
 4  
 Governor no. : 0 420 033 039

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM601 (2,3L)

1st version kW : 44.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1480

Rack travel in mm : 11.70...11.80

Del.quantity cm3/ : 3.7...3.8

100 s : (3.6...3.9)

Spread cm3 : 0.2

100 s : (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 0.5...0.7

100 s : (0.4...0.9)

Spread cm3 : 0.1

100 s : (0.1)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1480

Del.quantity : 37.5...38.5

1000 : (36.5...39.5)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: -

Testing:

1st rack travel in: 10.80

Speed rpm : 1520...1530

2nd rack travel in: 4.00

Speed rpm : 1590...1620

4th rack travel in: 1750

Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: -  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack trave: 20.10  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1480  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 1100  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 1350  
Rack travel in m: 12.10...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100  
Del.quantity cm3/ : 39.0...40.0  
1000 s: (38.0...41.0)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Speed rpm : 1350  
Del.quantity cm3/ : 38.5...40.0  
1000 s: (37.5...41.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 10.80  
Speed rpm : 1520...1530

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.0...7.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

Remarks:

:  
Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,4 V11  
 Edition : 15.10.91  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 400 074 895

Injection pump  
 Pump designation : PES4M55C32ORS110  
 EP type number : 0 410 054 956  
 Governor  
 Governor design. : RSF375/1700M21-1  
 Governor no. : 0 420 021 149

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM616 2.4L ADA  
 1st version kW : 41.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)  
 Rack travel in mm : 20.00...0.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.00 (1.00)

## BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 11.70...11.80

---

Del.quantity cm<sup>3</sup>/ : 3.1...3.2  
 100 s : (3.0...3.3)

---

Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

---

2nd speed rpm : 375.0  
 Rack travel in mm : 6.0...6.2  
 Del.quantity cm<sup>3</sup>/ : 0.6...0.7  
 100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1100  
 Del.quantity : 31.5...32.5  
 1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 6,8...7,2  
 Speed rpm : 1900  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever  
 position degrees: 8...12  
 Setting point w/out bumper spring  
 Speed rpm : 375  
 Rack travel in mm : 6.1





BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,3 d  
 Edition : 14.10.91  
 Replaces : 17.07.89  
 Test oil : ISO 4113  
 Combination no. : 0 400 074 908  
 Injection pump  
 Pump designation : PES4M55C320RS167  
 EP type number : 0 410 054 96^  
 Governor  
 Governor design. : RSF375/2000M69  
 Governor no. : 0 420 021 100

Customer-spec. information  
 Customer : DB

Engine : OM601-2.3L  
 1st version kW : 60.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 469 990 351  
 Inlet press., bar : 1.00  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.00(1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 12.80...12.90  
 Del.quantity cm3/ : 4.0...4.1  
 100 s: (3.9...4.2)  
 Spread cm3 : 0.2  
 100 s: (0.3)  
 2nd speed rpm : 375  
 Rack travel in mm : 5.0...5.2  
 Del.quantity cm3/ : 0.5...0.6  
 100 s: (0.4...0.9)  
 Spread cm3 : 0.1  
 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1100  
 Del.quantity : 40.0...41.0  
 1000 : (39.0...42.0)  
 Spread cm3 : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 7.0...7.5  
 Speed rpm : 2200  
 4th rack travel in: 2500  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever  
 position degrees: 11...15  
 Setting point w/out bumper spring  
 Speed rpm : 375  
 Rack travel in mm : 5.1

Testing:

Speed rpm : 250  
Minimum rack trave: 10.20  
Speed rpm : 375  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 3.00  
Speed rpm : 450...550  
Speed rpm : 1000  
Maximum rack trave: 1.50

SET IDLE AUXILIARY SPRING

Speed rpm : 420  
Rack travel in mm : 3.9...4.1  
: (3.8...4.2)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 1400  
Rack travel in m: 12.20...12.50  
3rd speed rpm : 2000  
Rack travel in m: 11.40...11.70  
4th speed rpm : 500  
Rack travel in m: 12.10...12.40\*  
5th speed rpm : 800  
Rack travel in m: 12.40...12.70\*\*

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

Measurement

Speed 1/min : 1000  
1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm3/ : 39.5...41.0  
1000 s: (38.5...42.0)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 2000

Del.quantity cm3/ : 39.5...41.5  
1000 s: (38.5...42.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 500 \*  
Del.quantity cm3/ : 34.5...36.0  
1000 s: (33.5...37.0)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 800\*\*  
Del.quantity cm3/ : 37.5...39.0  
1000 s: (36.5...40.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

INTERMEDIATE RATED SPEED

Control lever  
position degrees: 40.0...0.0  
Rack travel in mm : -(0,3)  
Speed rpm : 500

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Rack travel in mm : 7.00...7.50  
Del.quantity cm3/ : 22.00...26.00  
1000 s: (21.00...27.00)  
Spread cm3 : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 375  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

SETTING PNEUMATIC FAST IDLE  
(ELA)

Speed rpm : 425  
Rack travel in mm : 6.4...8.0

Del. quantity  $\text{cm}^3/1000 \text{ s}$  : -  
                  (11.0...19.0)  
Vacuum           hPa : 400

Sliding sleeve pre-travel = 6.25 mm

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 375 \text{ 1/min.}$  and  $p_u = 450 \text{ mbar}$ ,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP 1077 = 15.3^\circ \dots 15.7^\circ$   
( $15.2 \dots 15.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:  
Control-rod travel and delivery too  
large - position spiral spring  
downwards  
Control-rod travel and delivery too  
small - position spiral spring upwards

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,9 A  
 Edition : 15.10.91  
 Replaces : 10.11.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 009  
 Injection pump  
 Pump designation : PES5M55C32ORS176  
 EP type number : 0 410 055 975  
 Governor  
 Governor design. : RSV350...1650MDC353-  
 6  
 Governor no. : 0 420 033 042

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM602 (2,9L)

1st version kW : 62.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1630

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 4.0...4.1

100 s: (3.9...4.2)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.7

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1630

Del.quantity : 40.5...41.5

1000 : (39.5...42.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 53...61

Testing:

1st rack travel in: 11,2

Speed rpm : 1670...1680

2nd rack travel in: 4.00

Speed rpm : 1775...1793

4th rack travel in: 2000

Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack trave: 20.10  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1630  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 1000  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 1400  
Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1000  
Del.quantity cm3/ : 40.0...41.5  
1000 s: (39.0...42.5)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Speed rpm : 1400  
Del.quantity cm3/ : 39.5...41.5  
1000 s: (38.5...42.5)  
Spread cm3 : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.0...7.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

Remarks:

:

D27

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,9 B1  
 Edition : 15.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 010  
 Injection pump  
 Pump designation : PESSM55C32ORS176  
 EP type number : 0 410 055 975  
 Governor  
 Governor design. : RSV350...1500MOC353-9  
 Governor no. : 0 420 033 040

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM602 (2,9L)

1st version kW : 54.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 20.00...22.00

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1480

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.5...3.6

100 s: (3.4...3.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.7

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1480

Del.quantity : 35.0...36.0

1000 : (34.0...37.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 47...55

Testing:

1st rack travel in: 10.40

Speed rpm : 1520...1530

2nd rack travel in: 4.00

Speed rpm : 1610...1628

4th rack travel in: 1750

Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack travel: 20.10  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1480  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 1000  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 1300  
Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1000  
Del.quantity cm3/ : 38.0...39.5  
1000 s: (37.0...40.5)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Speed rpm : 1300  
Del.quantity cm3/ : 35.0...37.0  
1000 s: (34.0...38.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 10.40  
Speed rpm : 1520...1530

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.0...7.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

Remarks:

:  
Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,9 B2  
 Edition : 15.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 011  
 Injection pump  
 Pump designation : PES5M55C320RS176  
 EP type number : 0 410 055 975  
 Governor  
 Governor design. : RSV400...2000MDC353-  
 5  
 Governor no. : 0 420 033 041

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM602 (2,9L)  
 1st version kW : 69.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 469 990 351  
 Inlet press., bar : 1.00  
 Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 20.00...22.00

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1980  
 Rack travel in mm : 11.80...11.90  
 Del.quantity cm<sup>3</sup>/ : 3.9...4.0  
 100 s: (3.8...4.1)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm<sup>3</sup>/ : 0.5...0.7  
 100 s: (0.4...0.9)  
 Spread cm<sup>3</sup> : 0.1  
 100 s: (0.1)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1980  
 Del.quantity : 39.5...40.5  
 1000 : (38.5...41.5)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: -

Testing:  
 1st rack travel in: 10.90  
 Speed rpm : 2020...2030  
 2nd rack travel in: 4.00  
 Speed rpm : 2130...2148  
 4th rack travel in: 2250  
 Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever position degrees: -  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack trave: 20.10  
Speed rpm : 400  
Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1980  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 750  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 1500  
Rack travel in m: 12.60...12.80  
4th speed rpm : 1650  
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750  
Del.quantity cm3/ : 39.0...40.0  
1000 s: (38.0...41.0)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Speed rpm : 1500  
Del.quantity cm3/ : 40.0...41.5  
1000 s: (39.0...42.5)  
Spread cm3 : 2.50  
1000 s: (3.00)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 10.90  
Speed rpm : 2020...2030

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

LOW IDLE

D26

Speed rpm : 400  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.0...7.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

Remarks:

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : Mb 2,5 H11  
 Edition : 15.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 928  
 Injection pump  
 Pump designation : PES5M55C320RS170  
 EP type number : 0 410 055 977  
 Governor  
 Governor design. : RSF350/2300M71-4  
 Governor no. : 0 420 021 164

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602-ECE MJ90 ADA

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 12.30...12.40  
 Del. quantity cm<sup>3</sup>/ : 3.2...3.3  
 100 s : (3.1...3.4)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.5...6.7  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.4...0.9)  
 Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1100  
 Del. quantity : 32.0...33.0  
 1000 : (31.0...34.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 8.5...8,9  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,2...1,3

LOW IDLE 1  
 Control lever  
 position degrees: 12...16  
 Setting point w/out bumper spring



-Control lever up against idle stop.  
At  $n = 350$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

ADJUSTMENT OF ACTIVE BUCKING DAMPING  
(ARD)  
Control lever on full-load stop. At  $n$   
= 1000 min.  $^{-1}$ ,  $I = 2.5$  A, difference  
in delivery referenced to full-load  
delivery (6.3...8.3) ccm/1000 strokes.

Engine with two-mass flywheel

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 W39  
 Edition : (8.10.91  
 Replaces : --  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 929  
 Injection pump  
 Pump designation : PES5M55C320RS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/2300M64-18  
 Governor no. : 0 420 021 159

Cust. part no. : T3

Customer-spec. information  
 Customer : MB-PKW

Engine : DM602A-USA

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del.quantity cm3/ : 5.1...5.2  
 100 s : (5.0...5.3)

Spread cm3 : 0.2  
 100 s : (0.3)

2nd speed rpm : 315.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm3/ : 0.5...0.6  
 100 s : (0.4...0.85)  
 Spread cm3 : 0.1  
 100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1850  
 Del.quantity : 51.0...52.0  
 1000 : (50.0...53.0)  
 Spread cm3 : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 8,5...8,9  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,7...1,8

LOW IDLE 1  
 Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 520...620  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
: (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 49.5...51.0  
1000 s: (48.5...52.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s: (4.0...8.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12.7...14.1)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (41.0...49.0)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current

short-duration A : 3.0

#### Starting test

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop.
- With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit

KDEP-P400

#### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.457...2.517 (2.427...2.547) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 21.0...22.0 (20.0...23.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633...1.639$  (1.635...1.637) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-load stop; voltage value of 2.457...2.517 V must be attained.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 W40  
 Edition : 11.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 930  
 Injection pump  
 Pump designation : PES5M55C32ORS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/230CM74-1  
 Governor no. : 0 420 021 156

Cust. part no. : T3

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-D/A (KAT)

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

E05

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 345.0

Rack travel in mm : 5.5...5.7

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.85)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.5...8.9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever



Remarks:

Spring-retainer setting: at 1000 min<sup>-1</sup>  
= 1.7...1.8 mm

Sliding sleeve pre-travel = 4.7 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position 35,5°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.
- Control-lever position 33.0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n = 1000$  min.<sup>-1</sup>,  
 $I = 2.5$  A, difference in delivery referenced to full-load  
delivery (9.0...11.0) ccm/1000 strokes.

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 17.3°...17.7°  
(17.2...17.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

#### Testing and adjusting the control-rod- travel sensor with evaluation circuit

KDEP-P400

#### Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.457...2.517  
(2.427...2.547) V must be displayed  
on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel  
delivery at 21.0...22.0 (20.0...23.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633...1.639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.457...  
2.517 V must be attained.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 c7  
Edition : 08.10.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 936  
  
Injection pump  
Pump designation : PES5M55C32ORS158  
EP type number : 0 410 055 986  
Governor  
Governor design. : RSF340/2300M64-14  
Governor no. : 0 420 021 142

Cust. part no. : T3

Customer-spec. information  
Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s : (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del. quantity cm<sup>3</sup>/ : 0.55...0.65

100 s : (0.45...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.15)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever



Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

#### Testing and adjusting the control-rod- travel sensor with evaluation circuit KDEP-P400

##### Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

##### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel  
delivery at 23.0...24.0 (22.0...25.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633 \dots 1.639$  ( $1.635 \dots 1.637$ ) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.472...  
2.532 V must be attained.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $35,5^\circ$ , max.

0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position  $33,0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 C2  
Edition : 14.10.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 075 937  
Injection pump  
Pump designation : PESSM55C320RS158  
EP type number : 0 410 055 986  
Governor  
Governor design. : RSF340/2300M74  
Governor no. : 0 420 021 140

Cust. part no. : T3  
Customer-spec. information  
Customer : MB-PKW  
Engine : OM602A-Abgasl.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
Overflow valve : 1 469 990 351  
Inlet press., bar : 1.00  
Test nozzle holder assembly : 0 681 343 009  
Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288  
Tolerance + - ° : 0.00 (1.00)  
Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 13.90...14.00  
Del.quantity cm3/ : 5.1...5.2  
100 s: (5.0...5.3)  
Spread cm3 : 0.2  
100 s: (0.3)

2nd speed rpm : 345.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm3/ : 0.5...0.6  
100 s: (0.4...0.85)  
Spread cm3 : 0.1  
100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1850  
Del.quantity : 51.0...52.0  
1000 : (50.0...53.0)  
Spread cm3 : 2.50  
1000 : (3.00)

RATED SPEED

1st version  
Control lever  
position degrees: 50...0  
3rd rack travel in: 8.1...8.5  
Speed rpm : 2500  
4th rack travel in: 2950  
Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
Rack travel in mm : 1.7...1.8

LOW IDLE 1  
Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 345  
Rack travel in mm : 5.4

Testing:

Speed rpm : 150  
Minimum rack trave: 11.00  
Speed rpm : 345  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.2...4.4  
: (4.1...4.5)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.5)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 345  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s: (4.0...8.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 370  
Rack travel in mm : (10.0...11.4)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (31,5...39,5)  
Current A : 1.8

Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 1.8A



Remarks:

Sliding sleeve pre-travel = 4.7 mm

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 345$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $35,5^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position  $33.0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

ADJUSTMENT OF ACTIVE BUCKING DAMPING  
(ARD)

Control lever on full-load stop. At  $n =$   
1000 min.<sup>-1</sup>,  
 $I = 2.5$  A, difference in delivery  
referenced to full-load  
delivery (4.4...6.4) ccm/1000 strokes.

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Spring-retainer setting: at 1000 min<sup>-1</sup>  
= 1.7...1.8 mm

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 23.0...24.0 (22.0...25.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633 \dots 1.639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.472...  
2.532 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 C3  
 Edition : 15.10.91  
 Replaces : 13.11.89  
 Test oil : ISO-4113

Combination no. : 0 400 075 938

Injection pump  
 Pump designation : PES5M55C320RS170  
 EP type number : 0 410 055 977  
 Governor  
 Governor design. : RSF350/2300M71-3  
 Governor no. : 0 420 021 136

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602-ECE MJ90 ADA

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 12.30...12.40

---

Del.quantity cm3/ : 3.2...3.3  
 100 s: (3.1...3.4)

---

Spread cm3 : 0.2  
 100 s: (0.3)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 6.5...6.7  
 Del.quantity cm3/ : 0.5...0.6  
 100 s: (0.4...0.9)

Spread cm3 : 0.1  
 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1100  
 Del.quantity : 32.0...33.0  
 1000 : (31.0...34.0)

Spread cm3 : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 8,5...8,9  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,2...1,3

LOW IDLE 1

Control lever  
 position degrees: 12...16  
 Setting point w/out bumper spring



control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n$   
= 1000 min.<sup>-1</sup>,  $I = 2.5$  A, difference  
in delivery referenced to full-load  
delivery (6.3...8.3) ccm/1000 strokes.

Pin projection = 16.60...16.70 mm

Engine with two-mass flywheel

Spring-retainer setting: at 1000 min.<sup>-1</sup>  
= 1.2...1.3 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 C4  
 Edition : 15.10.91  
 Replaces : 13.11.89  
 Test oil : ISO-4113

Combination no. : 0 400 075 939

Injection pump  
 Pump designation : PES5M55C32ORS173  
 EP type number : 0 410 055 976  
 Governor  
 Governor design. : RSF350/2300M71-2  
 Governor no. : 0 420 021 135

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602-Abgl. MJ90 ADA

1st version kW : 64.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1-2- 4- 5- 3

E17

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 3.1...3.2  
 100 s: (3.0...3.3)

Spread cm3 : 0.2  
 100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.5...0.6  
 100 s: (0.4...0.9)

Spread cm3 : 0.1  
 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1100  
 Del.quantity : 31.5...32.5  
 1000 : (30.5...33.5)

Spread cm3 : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0

3rd rack travel in: 9.1...9.5  
 Speed rpm : 2500

4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever  
 position degrees: 12...16  
 Setting point w/out bumper spring

Speed rpm : 350  
Rack travel in mm : 6.5

#### Testing:

Speed rpm : 150  
Minimum rack travel: 11.0+1  
Speed rpm : 350  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.50  
Speed rpm : 600...700  
Speed rpm : 1000  
Maximum rack travel: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 5,2...5,4  
: (5,1...5,5)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 1800  
Rack travel in m: 11.80...12.00  
3rd speed rpm : 2200  
Rack travel in m: 11.50...11.70

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1800  
Del.quantity cm<sup>3</sup>/ : 34.5...36.0  
1000 s: (33.5...37.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 33.0...35.0  
1000 s: (32.0...36.0)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 9.10...9.50  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 400  
Rack travel in mm : (6,7...8,1)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (5,0...13,0)  
Vacuum hPa : 400

#### Remarks:

Sliding sleeve pre-travel = 5.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.

At  $n = 350$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $17.3^\circ \dots 17.7^\circ$   
( $17.2 \dots 17.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n$   
= 1000 min.  $-1$ ,  $I = 2.5$  A, difference  
in delivery referenced to full-load  
delivery ( $6.3 \dots 8.3$ ) ccm/1000 strokes.

Pin projection =  $16.60 \dots 16.70$  mm

Engine with two-mass flywheel

Starting control-rod  
travel =  $11.0 \dots 12.0$  mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 C10  
 Edition : 14.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 944  
 Injection pump  
 Pump designation : PES5M55C320RS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/2300M64-12  
 Governor no. : 0 420 021 127

Cust. part no. : T3

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-USA MJ90

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del. quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.6...5.8

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.85)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.5...8.9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever





Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop. With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit

KDEP-P400

#### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 18.5...19.5 (17.50...20.5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633...1.639$  (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487...

2.547 V must be attained.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 2,5 H4  
 Edition : 15.10.91  
 Replaces : 17.02.89  
 Test oil : ISO-4113

Combination no. : 0 400 075 952

Injection pump  
 Pump designation : PES5M55C32ORS170  
 EP type number : 0 410 055 977  
 Governor  
 Governor design. : RSF350/2300M56-5  
 Governor no. : 0 420 021 112

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602-ECE ADA

1st version kW : 66.0

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 3.2...3.3  
 100 s : (3.1...3.4)

Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.5...6.7  
 Del.quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.4...0.9)

Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Aneroid pressure h : 1100  
 Del.quantity : 32.0...33.0  
 1000 : (31.0...34.0)

Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 8,5...8,9  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

**SET IDLE CONTROL LEVER POSITION**

Speed rpm : 1000  
 Rack travel in mm : 1,2...1,3

**LOW IDLE 1**

Control lever  
 position degrees: 12...16  
 Setting point w/out bumper spring

Speed rpm : 350  
Rack travel in mm : 6.6

#### Testing:

Speed rpm : 220  
Minimum rack travel : 9.50  
Speed rpm : 350  
Rack travel in mm : 6.50...6.70  
Rack travel in mm : 2.00  
Speed rpm : 670...770  
Speed rpm : 1000  
Maximum rack travel : 1.30

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 5.4...5.6  
: (5.3...5.7)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 1800  
Rack travel in m: 11.70...11.90  
3rd speed rpm : 2200  
Rack travel in m: 11.40...11.60

#### Aneroid/Altitude Compensator Test

1st version  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20  
  
1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 1800  
Del. quantity cm<sup>3</sup>/ : 34.0...35.5  
1000 s: (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del. quantity cm<sup>3</sup>/ : 34.0...36.0  
1000 s: (33.0...37.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del. quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.50...6.70  
Del. quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 400  
Rack travel in mm : (6.8...8.4)  
Del. quantity cm<sup>3</sup>/ : -  
1000 s: (6.0...14.0)  
Vacuum hPa : 400

Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 350 1/min and pu = 450 mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Pin projection =  $16.60 \dots 16.70$  mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,9 D2  
 Edition : 15.10.91  
 Replaces : 13.11.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 955  
 Injection pump  
 Pump designation : PES5M55C320RS168  
 EP type number : 0 410 055 978  
 Governor  
 Governor design. : RSF340/2000M70-2  
 Governor no. : 0 420 021 107

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM602-2.9L / ADA

1st version kW : 72.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 12.50...12.60  
 Del. quantity cm<sup>3</sup>/ : 3.8...3.9  
 100 s : (3.7...4.0)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 315.0  
 Rack travel in mm : 5.3...5.5  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.4...0.9)  
 Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1100  
 Del. quantity : 38.0...39.0  
 1000 : (37.0...40.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 7.0...7,5  
 Speed rpm : 2500  
 4th rack travel in: 2500  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,4...1,5

LOW IDLE 1  
 Control lever  
 position degrees: 12...16  
 Setting point w/out bumper spring

Speed rpm : 315  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 250  
Minimum rack travel: 7.00  
Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 500...600  
Speed rpm : 1000  
Maximum rack travel: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,0...4,2  
: (3,9...4,3)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 1400  
Rack travel in m: 12.10...12.40  
3rd speed rpm : 2000  
Rack travel in m: 11.60...11.90  
4th speed rpm : 500 \*  
Rack travel in m: 12.20...12.40  
5th speed rpm : 800\*\*  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm<sup>3</sup>/ : 38.0...39.5  
1000 s: (37.0...40.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1100

Speed rpm : 2000  
Del.quantity cm<sup>3</sup>/ : 39.5...41.5  
1000 s: (38.5...42.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 500 \*  
Del.quantity cm<sup>3</sup>/ : 34.5...36.0  
1000 s: (33.5...37.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 800\*\*  
Del.quantity cm<sup>3</sup>/ : 36.5...38.0  
1000 s: (35.5...39.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### INTERMEDIATE RATED SPEED

Control lever  
position degrees: 40.0...0.0  
Rack travel in mm : -(0,3)  
Speed rpm : 500

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 2200  
Rack travel in mm : 7.00...7.50  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340

Rack travel in mm : (11,6...13,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s : (29,0...37,0)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2500  
Rack travel in mm : 0,0...1,0  
Current

short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s : 52,0 1,8A

Remarks:

:

Sliding sleeve pre-travel = 6.25 mm

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $15.3^\circ \dots 15.7^\circ$   
( $15.2 \dots 15.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Pin projection = 16.60...16.70 mm

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:  
Control-rod travel and delivery too  
large - position spiral spring  
downwards  
Control-rod travel and delivery too  
small - position spiral spring upwards



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,9 D3  
 Edition : 15.10.91  
 Replaces : 06.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 956  
 Injection pump  
 Pump designation : PES5M55C32ORS168  
 EP type number : 0 410 055 978  
 Governor  
 Governor design. : RSF350/1900M69-3  
 Governor no. : 0 420 021 104

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM602-2.9L / ADA

1st version kW : 70.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

F01

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del. quantity cm<sup>3</sup>/ : 3.8...3.9

100 s: (3.7...4.0)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del. quantity : 38.0...39.0

1000 : (37.0...40.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7.0...7,5

Speed rpm : 2100

4th rack travel in: 2500

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 350  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 250  
Minimum rack trave: 9.20  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 3.00  
Speed rpm : 470...570  
Speed rpm : 1000  
Maximum rack trave: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
: (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 1400  
Rack travel in m: 12.10...12.40  
3rd speed rpm : 1900  
Rack travel in m: 11.60...11.90  
4th speed rpm : 500 \*  
Rack travel in m: 12.20...12.40  
5th speed rpm : 800\*\*  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm3/ : 38.0...39.5  
1000 s: (37.0...40.5)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1100

F02

Speed rpm : 1900  
Del.quantity cm3/ : 39.5...41.5  
1000 s: (38.5...42.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 500 \*  
Del.quantity cm3/ : 34.5...36.0  
1000 s: (33.5...37.0)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 800\*\*  
Del.quantity cm3/ : 36.5...38.0  
1000 s: (35.5...39.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### INTERMEDIATE RATED SPEED

Control lever  
position degrees: 40...0  
Rack travel in mm : -(0,3)  
Speed rpm : 500

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1100  
Speed rpm : 2100  
Rack travel in mm : 7.00...7.50  
Del.quantity cm3/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 400  
Rack travel in mm : (5,2...6,8

Del. quantity cm<sup>3</sup>/ : -  
1000 s: (5.0...13,0)  
Vacuum hPa : 400

Remarks:

:

Sliding sleeve pre-travel = 6.25 mm

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At n = 350 1/min and pu = 450 mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Pin projection = 16.60...16.70 mm

\* Setting point for negative torque  
control - negative retainer behind  
sliding sleeve

\*\* Reference measurement:  
Control-rod travel and delivery too  
large - position spiral spring  
downwards  
Control-rod travel and delivery too  
small - position spiral spring upwards

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3.0 W37  
Edition : 14.10.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 076 956  
Injection pump  
Pump designation : PES6M55C320RS181  
EP type number : 0 410 056 983  
Governor  
Governor design. : RSF305/2125M64-20  
Governor no. : 0 420 021 168

Customer-spec. information  
Customer : MB-PKW

Engine : OM603A D35 USA  
1st version kW : 110.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
                  : (1.65...1.85)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.10...14.20

Del.quantity cm<sup>3</sup>/ : 5.9...6.0

100 s : (5.8...6.1)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 280.0

Rack travel in mm : -

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h : 1900

Del.quantity : 59.0...60.0

1000 : (58.0...61.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever  
position degrees: 50...0

3rd rack travel in: 9.2...9.6

Speed rpm : 2500

4th rack travel in: 2700

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

LOW IDLE 1

Control lever  
position degrees: 8...12

Setting point w/out bumper spring



allowable after switchover point (of starting cam) up to 1000 1/min.  
-Control-lever position  $33.0^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY  
-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400

Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 24.0...25.0 (23.0...26.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633...1.639$  (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487...2.547 V must be attained.

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 =  $17.3^\circ...17.7^\circ$  ( $17.2...17.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3,0 W42  
 Edition : 15.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 957  
 Injection pump  
 Pump designation : PES6M55C320RS171  
 EP type number : 0 410 056 989  
 Governor  
 Governor design. : RSF315/2300M72-5  
 Governor no. : 0 420 021 165  
 Customer-spec. information  
 Customer : MB-PKW  
 Engine : OM603-ECE MJ90 / ADA  
 1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 469 990 351  
 Inlet press., bar : 1.00  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test Lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

F07

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 12.00...12.10  
 Del.quantity cm<sup>3</sup>/ : 3.1...3.2  
 100 s : (3.0...3.3)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.8...7.0  
 Del.quantity cm<sup>3</sup>/ : 0.6...0.7  
 100 s : (0.6...1.0)  
 Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1100  
 Del.quantity : 31.0...32.0  
 1000 : (30.0...33.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 8,5...8,9  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,2...1,3

LOW IDLE 1  
 Control lever  
 position degrees: 12...16  
 Setting point w/out bumper spring





0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 300$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n = 1000$  min.  $-1$ ,  $I = 2.5$  A, difference in delivery referenced to full-load delivery (6.3...8.3) ccm/1000 strokes.

Pin projection = 16.60...16.70 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3.0 W38  
 Edition : 14.10.91  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 400 076 958

Injection pump  
 Pump designation : PES6M55C320RS181  
 EP type number : 0 410 056 983  
 Governor  
 Governor design. : RSF315/2125M64-19  
 Governor no. : 0 420 021 162

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A D35 USA

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.10...14.20

Del. quantity cm<sup>3</sup>/ : 5.9...6.0

100 s : (5.8...6.1)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.5...5.7

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.95)

Spread cm<sup>3</sup> : 0.1

100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1900

Del. quantity : 59.0...60.0

1000 : (58.0...61.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9.2...9.6

Speed rpm : 2300

4th rack travel in: 2700

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.9...2.0

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 5.6

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 1000  
Maximum rack travel: 2.00

SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 4.3...4.5  
: (4.2...4.6)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 14.10...14.20  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.20  
3rd speed rpm : 2000  
Rack travel in m: 12.20...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.80...1.20

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.70...3.90  
2nd pressure hPa : 750  
Rack travel in m: 5.20...5.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1900  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 56.5...58.0  
1000 s: (55.5...59.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1900  
Speed rpm : 2000  
Del.quantity cm<sup>3</sup>/ : 54.0...56.0  
1000 s: (53.0...57.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000

Del.quantity cm<sup>3</sup>/ : 38.0...39.0  
1000 s: (37.0...40.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Aneroid pressure h: 1900  
Speed rpm : 2300  
Rack travel in mm : 9.20...9.60  
Del.quantity cm<sup>3</sup>/ : 37.0...41.0  
1000 s: (36.0...42.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (11.5...12.9)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: 41.0...49.0)  
Current A : 1.8

Control lever at full-load stop

Speed rpm : 2700  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 1.8A

Remarks:

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF  
-Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

-Control-lever position  $33.0^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 =  $17.3^\circ \dots 17.7^\circ$  ( $17.2 \dots 17.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400

##### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

##### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 24.0...25.0 (23.0...26.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633 \dots 1.639$  (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487...2.547 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3.0 W39  
 Edition : 14.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 959  
 Injection pump  
 Pump designation : PES6M55C32ORS180  
 EP type number : 0 410 056 984  
 Governor  
 Governor design. : RSF315/2300M64-17  
 Governor no. : 0 420 021 157

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A-D/A (KAT)

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 13.70...13.80  
 Del. quantity cm<sup>3</sup>/ : 5.1...5.2  
 100 s : (5.0...5.3)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 290.0  
 Rack travel in mm : 5.4...5.6  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.5...0.95)  
 Spread cm<sup>3</sup> : 0.1  
 100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1850  
 Del. quantity : 51.0...52.0  
 1000 : (50.0...53.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 8.4...8.8  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1.7...1.8

LOW IDLE 1  
 Control lever  
 position degrees: 8...12  
 Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 5.5

Testing:

Speed rpm : 200  
Minimum rack travel : 7.00  
Speed rpm : 290  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 520...620  
Speed rpm : 1000  
Maximum rack travel : 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4.2...4.4  
                                  : (4.1...4,5)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
                  1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
          1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
                  1000 s: (47.5...51.5)

Spread cm3 : 2.50  
          1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
                  1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
          1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.40...8.80  
Del.quantity cm3/ : 29.0...33.0  
                  1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
          1000 s: (3.00)

LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
                  1000 s: (5.0...9.5)  
Spread cm3 : 1.00  
          1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (13.1...14.5)  
Del.quantity cm3/ : -  
                  1000 s: (43.0...51.0)  
Current A : 1.8

Control lever at full-load stop  
Speed rpm : 100  
Rack travel in mm : 0.0...1.0  
Current

short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52.0 1.8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $35,5^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position  $33,0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $17,3^\circ \dots 17,7^\circ$   
( $17,2^\circ \dots 17,8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY  
-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 21.0...22.0 (20.0...23.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633 \dots 1.639$  ( $1.635 \dots 1.637$ ) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.457...  
2.517 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3,0 W46  
 Edition : 16.10.91  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 400 076 960

Injection pump  
 Pump designation : PES6M55C320RS179  
 EP type number : 0 410 056 985  
 Governor  
 Governor design. : RSF315/2000M65-16  
 Governor no. : 0 420 021 158

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A D35 GW / ALDA

1st version kW : 100.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 13.60...13.70

---

Del.quantity cm<sup>3</sup>/ : 5.6...5.7  
 100 s: (5.5...5.8)

---

Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)

---

2nd speed rpm : 290.0  
 Rack travel in mm : 5.7...5.9  
 Del.quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1  
 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1900  
 Del.quantity : 56.5...57.5  
 1000 : (55.5...58.5)

Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 7,2...7,6  
 Speed rpm : 2300  
 4th rack travel in: 2700  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,9...2,0

LOW IDLE 1

Control lever  
 position degrees: 8...12  
 Setting point w/out bumper spring



Speed rpm : 290  
Rack travel in mm : 5.8

Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 3.00  
Speed rpm : 500...600  
Speed rpm : 1000  
Maximum rack travel: 2.00

SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 4,2...4,4  
: (4,1...4,5)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 1600  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 2000  
Rack travel in m: 11.60...11.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.80...1.20

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.30...3.50  
2nd pressure hPa : 750  
Rack travel in m: 4.80...5.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1900  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 52.5...54.0  
1000 s: (51.5...55.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1900  
Speed rpm : 2000  
Del.quantity cm<sup>3</sup>/ : 50.0...52.0  
1000 s: (49.0...53.0)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 38.0...39.0  
1000 s: (37.0...40.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1900  
Speed rpm : 2300  
Rack travel in mm : 7.30...7.40  
Del.quantity cm<sup>3</sup>/ : 25.5...29.5  
1000 s: (24.5...30.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (11,8...13,2)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (43,5...50,5)  
Current A : 1,8

Control lever at full-load stop

Speed rpm : 2700  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0 1,8A

Remarks:

Sliding sleeve pre-travel = 5.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

- Control-lever position 35,5°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.
- Control-lever position 33.0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

- Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 17.3°...17.7°  
(17.2...17.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3,0 W45  
 Edition : 16.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 960  
 Injection pump  
 Pump designation : PES6M55C32ORS179  
 EP type number : 0 410 056 985  
 Governor  
 Governor design. : RSF315/2000M65-6  
 Governor no. : 0 420 021 161  
 Customer-spec. information  
 Customer : MB-PKW  
 Engine : OM603A D35 GW / ALDA  
 1st version kW : 100.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 469 990 351  
 Inlet press., bar : 1.00  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 13.60...13.70  
 Del. quantity cm<sup>3</sup>/ : 5.6...5.7  
 100 s : (5.5...5.8)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)  
 2nd speed rpm : 290.0  
 Rack travel in mm : 5.7...5.9  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.5...0.9)  
 Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1900  
 Del. quantity : 56.5...57.5  
 1000 : (55.5...58.5)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 7,2...7,6  
 Speed rpm : 2300  
 4th rack travel in: 2700  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,9...2,0

LOW IDLE 1

Control lever  
 position degrees: 8...12  
 Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 5.8

Testing:

Speed rpm : 200  
Minimum rack travel : 7.00  
Speed rpm : 290  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 3.00  
Speed rpm : 500...600  
Speed rpm : 1000  
Maximum rack travel : 2.00

SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 4,2...4,4  
                              : (4,1...4,5)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m : 13.60...13.70  
2nd speed rpm : 1600  
Rack travel in m : 12.50...12.70  
3rd speed rpm : 2000  
Rack travel in m : 11.60...11.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.80...1.20

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m : 3.30...3.50  
2nd pressure hPa : 750  
Rack travel in m : 4.80...5.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h : 1900  
Speed rpm : 1600  
Del.quantity cm3/ : 52.5...54.0  
                              1000 s : (51.5...55.0)  
Spread cm3 : 2.50  
                              1000 s : (3.0)  
Aneroid pressure h : 1900  
Speed rpm : 2000  
Del.quantity cm3/ : 50.0...52.0  
                              1000 s : (49.0...53.0)

Spread cm3 : 2.50  
                              1000 s : (3.00)  
Aneroid pressure h : 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 38.0...39.0  
                              1000 s : (37.0...40.0)  
Spread cm3 : 2.50  
                              1000 s : (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                              1000 s : (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h : 1900  
Speed rpm : 2300  
Rack travel in mm : 7.30...7.40  
Del.quantity cm3/ : 25.5...29.5  
                              1000 s : (24.5...30.5)  
Spread cm3 : 2.50  
                              1000 s : (3.00)

LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.70...5.90  
Del.quantity cm3/ : 5.5...6.5  
                              1000 s : (5.0...9.5)  
Spread cm3 : 1.00  
                              1000 s : (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (11,8...13,2)  
Del.quantity cm3/ : -  
                              1000 s : (43,5...50,5)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2700  
Rack travel in mm : 0.0...1.0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s : 52,0           1,8A

Remarks:

Sliding sleeve pre-travel = 5.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

- Control-lever position  $35,5^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.
- Control-lever position  $33,0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

- Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $17,3^\circ \dots 17,7^\circ$   
( $17,2^\circ \dots 17,8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3,0 W27  
 Edition : 15.10.91  
 Replaces : 19.07.89  
 Test oil : ISO-4113

Combination no. : 0 400 076 961

Injection pump  
 Pump designation : PES6M55C320RS157-1  
 EP type number : 0 410 056 991  
 Governor  
 Governor design. : RSF315/2300M65-5  
 Governor no. : 0 420 021 145

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A-ECE

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 13.90...14.00

---

Del.quantity cm<sup>3</sup>/ : 5.1...5.2  
 100 s: (5.0...5.3)

---

Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)

---

2nd speed rpm : 290.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1  
 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1850  
 Del.quantity : 51.0...52.0  
 1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control Lever  
 position degrees: 50...0  
 3rd rack travel in: 8,1...8,5  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,7...1,8

LOW IDLE 1  
 Control lever  
 position degrees: 8...12  
 Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 510...610  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4,2...4,4  
: (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (41,0...49,0)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position  $35.5^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.
- Control-lever position  $33.0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

- Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3.0 W28  
 Edition : 14.10.91  
 Replaces : 19.07.89  
 Test oil : ISO-4113

Combination no. : 0 400 076 962

Injection pump  
 Pump designation : PES6M55C32ORS157  
 EP type number : 0 410 056 993  
 Governor  
 Governor design. : RSF315/2300M64-15  
 Governor no. : 0 420 021 143

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A-Abgasl.

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.95)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever  
 position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 5.4

Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 510...610  
Speed rpm : 1000  
Maximum rack travel: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4.2...4.4  
                                  : (4.1...4.5)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
                          1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
                          1000 s: (47.5...51.5)

Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
                          1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                          1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
                          1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
                          1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
                          1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12.6...14.0)  
Del.quantity cm<sup>3</sup>/ : -  
                          1000 s: (41.0...49.0)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 100  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 1.8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

- Control lever up against idle stop. At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.  
Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY  
-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400

##### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

##### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633...1.639$  (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-

load stop; voltage value of 2.472...2.532 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : Mb 3,0 W37  
 Edition : 16.10.91  
 Replaces : 14.11.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 963  
 Injection pump  
 Pump designation : PES6M55C320RS157-1  
 EP type number : 0 410 056 991  
 Governor  
 Governor design. : RSF450/2300M68-1  
 Governor no. : 0 420 021 141

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM603A (3.0L)

1st version kW : 100.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

F28

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.10...13.20

Del.quantity cm<sup>3</sup>/ : 4.6...4.7

100 s : (4.5...4.8)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 450.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 46.5...47.5

1000 : (45.5...48.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.4...8,8

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

LOW IDLE 1

Control lever

position degrees: 10...14

Setting point w/out bumper spring

Speed rpm : 450  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 250  
Minimum rack travel: 12.50  
Speed rpm : 450  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 620...720  
Speed rpm : 1000  
Maximum rack travel: 2.00

#### SET IDLE AUXILIARY SPRING

Speed rpm : 500  
Rack travel in mm : 4,3...4,5  
: (4,2...4,6)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.10...13.20  
2nd speed rpm : 1600  
Rack travel in m: 12.40...12.60  
3rd speed rpm : 2200  
Rack travel in m: 11.50...11.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1500  
Rack travel mm : 0.00...0.40

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 2.70...2.90  
2nd pressure hPa : 750  
Rack travel in m: 4.40...4.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 45.5...47.0  
1000 s: (44.5...48.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 44.0...46.0  
1000 s: (43.0...47.0)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 34.0...35.0  
1000 s: (33.0...36.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.40...8.80  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 500  
Rack travel in mm : (6,8...8,4)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (14,0...22.0)  
Vacuum hPa : 600

#### Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position 33.0°,  
control-rod travel deduction must be

greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W29  
Edition : 16.10.91  
Replaces : 06.10.89  
Test oil : ISO-4113

Combination no. : 0 400 076 964

Injection pump  
Pump designation : PES6M55C320RS171  
EP type number : 0 410 056 989  
Governor  
Governor design. : RSF315/2300M72-4  
Governor no. : 0 420 021 138

Customer-spec. information  
Customer : MB-PKW

Engine : OM603-ECE MJ90 / ADA

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.00...12.10

Del. quantity cm<sup>3</sup>/ : 3.1...3.2  
100 s : (3.0...3.3)

Spread cm<sup>3</sup> : 0.2  
100 s : (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 6.8...7.0

Del. quantity cm<sup>3</sup>/ : 0.6...0.7  
100 s : (0.6...1.0)

Spread cm<sup>3</sup> : 0.1  
100 s : (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h : 1100  
Del. quantity : 31.0...32.0  
1000 : (30.0...33.0)

Spread cm<sup>3</sup> : 2.50  
1000 : (3.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 50...0

3rd rack travel in: 8,5...8,9  
Speed rpm : 2500

4th rack travel in: 2950  
Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
Rack travel in mm : 1,2...1,3

## LOW IDLE 1

Control lever  
position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 300  
Rack travel in mm : 6.9

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Rack travel in mm : 2.00  
Speed rpm : 620...720  
Speed rpm : 1000  
Maximum rack trave: 1.30

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 5,3...5,5  
: (5,2...5,6)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 1400  
Rack travel in m: 11.80...12.00  
3rd speed rpm : 2200  
Rack travel in m: 11.50...11.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm3/ : 31.0...32.5  
1000 s: (30.0...33.5)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del.quantity cm3/ : 34.0...36.0  
1000 s: (33.0...37.0)

Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm3/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del.quantity cm3/ : 6.5...7.5  
1000 s: (6.0...10.5)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (12,0...13,4)  
Del.quantity cm3/ : -  
1000 s: (27,0...35,0)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current

short-duration A : 3,0

#### Starting test

Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0 1,8A

#### Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.



0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 300$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$  ( $19.2 \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n = 1000$  min.  $-1$ ,  $I = 2.5$  A, difference in delivery referenced to full-load delivery (6.3...8.3) ccm/1000 strokes.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3.0 W30  
 Edition : 15.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 965  
 Injection pump  
 Pump designation : PES6M55C32ORS174  
 EP type number : 0 410 056 988  
 Governor  
 Governor design. : RSF315/2300M72-3  
 Governor no. : 0 420 021 137

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603-Abgl. MJ90/ADA  
 1st version kW : 76.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 469 990 351  
 Inlet press., bar : 1.00  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 1.70...1.80  
 : (1.65...1.85)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1-5- 3- 6- 2- 4

606

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 12.40...12.50  
 Del. quantity cm<sup>3</sup>/ : 3.1...3.2  
 100 s: (3.0...3.3)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 7.0...7.2  
 Del. quantity cm<sup>3</sup>/ : 0.6...0.7  
 100 s: (0.6...1.0)  
 Spread cm<sup>3</sup> : 0.1  
 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1100  
 Del. quantity : 31.5...32.5  
 1000 : (30.5...33.5)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 9.1...9,5  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1.4...1.5

LOW IDLE 1

Control lever  
 position degrees: 12...16  
 Setting point w/out bumper spring



0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 300$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n = 1000$  min.  $-1$ ,  $I = 2.5$  A, difference in delivery referenced to full-load delivery (6.3...8.3) ccm/1000 strokes.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3,0 W31  
 Edition : 16.10.91  
 Replaces : 03.07.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 966  
 Injection pump  
 Pump designation : PES6M55C320RS174  
 EP type number : 0 410 056 988  
 Governor  
 Governor design. : RSF315/2300M60-27  
 Governor no. : 0 420 021 134

Customer-spec. information  
 Customer : DB-PKW

Engine : OM603-Abgl. MJ90/ADA  
 1st version kW : 76.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 469 990 351  
 Inlet press., bar : 1.00  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

G09

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 12.40...12.50  
 Del. quantity cm<sup>3</sup>/ : 3.1...3.2  
 100 s : (3.0...3.3)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 290.0  
 Rack travel in mm : 6.6...6.8  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.5...0.9)  
 Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h : 1100  
 Del. quantity : 31.5...32.5  
 1000 : (30.5...33.5)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 9,1...9,5  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,4...1,5

LOW IDLE 1  
 Control lever  
 position degrees: 12...16  
 Setting point w/out bumper spring



0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device KDEP 1077 =  $17.3^\circ \dots 17.7^\circ$   
( $17.2 \dots 17.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB 3,0 W35  
 Edition : 14.10.91  
 Replaces : 14.11.89  
 Test oil : ISO-4113

Combination no. : 0 400 076 968

Injection pump  
 Pump designation : PES6M55C32ORS178  
 EP type number : 0 410 056 986  
 Governor  
 Governor design. : RSF315/2125M64-13  
 Governor no. : 0 420 021 128

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A D35 USA

1st version kW : 100.0

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

---

Rack travel in mm : 14.20...14.30

---

Del. quantity cm<sup>3</sup>/ : 5.8...5.9  
 100 s : (5.7...6.0)

---

Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 290.0  
 Rack travel in mm : 6.1...6.4  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.5...0.95)  
 Spread cm<sup>3</sup> : 0.1  
 100 s : (0.15)

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Aneroid pressure h : 1850  
 Del. quantity : 58.0...59.0  
 1000 : (57.0...60.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 7.0...7.4  
 Speed rpm : 2300  
 4th rack travel in: 2700  
 Speed rpm : 0.00...1.00

**SET IDLE CONTROL LEVER  
 POSITION**

Speed rpm : 1000  
 Rack travel in mm : 1,9...2,0

**LOW IDLE 1**

Control lever  
 position degrees: 8...12  
 Setting point w/out bumper spring





#### SPRING CUTOFF

- Control-lever position  $44,5^\circ$  max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position  $42,0^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

- Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $17.3^\circ \dots 17.7^\circ$   
( $17.2^\circ \dots 17.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel  
delivery at 21.0...22.0 (20.0...23.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633 \dots 1.639$  ( $1.635 \dots 1.637$ ) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.457...  
2.517 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 3,0 W23  
 Edition : 16.10.91  
 Replaces : 17.02.89  
 Test oil : ISO-4113

Combination no. : 0 400 076 971

Injection pump  
 Pump designation : PES6M55C32ORS171  
 EP type number : 0 410 056 989  
 Governor  
 Governor design. : RSF315/2300M60-8  
 Governor no. : 0 420 021 114

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603-ECE / ADA

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 3.1...3.2  
 100 s : (3.0...3.3)

Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1100  
 Del.quantity : 31.0...32.0  
 1000 : (30.0...33.0)

Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0

3rd rack travel in: 8,5...8,9  
 Speed rpm : 2500

4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,2...1,3

LOW IDLE 1

Control lever  
 position degrees: 12...16  
 Setting point w/out bumper spring



0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

Pin projection = 16.60...16.70 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : VOL 7,1 b  
 Edition : 20.09.91  
 Replaces : 12.9.86  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 517  
 Injection pump  
 Pump designation : PE6P110A32ORS494  
 EP type number : 0 411 816 162  
 Governor  
 Governor design. : RQV300...1200PA435-3  
 Governor no. : 0 421 813 498

Customer-spec. information  
 Customer : VOLVO

Engine : TD 71GA

1st version kW : 157.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 11.10...11.20  
 Del.quantity cm<sup>3</sup>/ : 11.0...11.2  
 100 s: (10.7...11.5)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.8)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.6...4.8  
 Del.quantity cm<sup>3</sup>/ : 1.2...1.6  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.60...1.60  
 2nd speed rpm : 400  
 travel mm : 2.40...2.70  
 3rd speed rpm : 800  
 travel mm : 4.50...4.70  
 4th speed rpm : 1240  
 travel mm : 8.20...8.40  
 5th speed rpm : 1330  
 travel mm : 9.20...9.40

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1000  
 Del.quantity : 110.0...112.0  
 1000 : (107.0...115.0)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (8.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1310...1340  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 300  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 300...480

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.10...11.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 420  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 290  
Rack travel in m: 10.20...10.40

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 112.5...115.5  
1000 s: (109.0...119.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 89.0...91.0  
1000 s: (86.0...94.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1240...1250

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...190.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.30...4.50  
Del.quantity cm<sup>3</sup>/ : 12.0...16.0  
1000 s: (-)  
Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 7,1 b 3  
 Edition : 20.09.91  
 Replaces : 12.9.86  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 524  
 Injection pump  
 Pump designation : PE6P110A32ORS494-1  
 EP type number : 0 411 816 168  
 Governor  
 Governor design. : RQV300...1200PA435-4  
 Governor no. : 0 421 813 527

Customer-spec. information  
 Customer : VOLVO

Engine : TD 71K

1st version kW : 177.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 11.90...12.20  
 Del. quantity cm<sup>3</sup>/ : 12.2...12.4  
 100 s: (11.9...12.7)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.8)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.8...5.0  
 Del. quantity cm<sup>3</sup>/ : 1.7...2.1  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.40...1.60  
 2nd speed rpm : 400  
 travel mm : 2.30...2.60  
 3rd speed rpm : 800  
 travel mm : 4.40...4.60  
 4th speed rpm : 1240  
 travel mm : 7.80...8.00  
 5th speed rpm : 1340  
 travel mm : 8.90...9.10

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1300  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1000  
 Del. quantity : 122.0...124.0  
 1000 : (119.0...127.0)



Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 10.90  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1330...1360  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 300  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 300...510

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.90...12.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.60...9.70  
2nd pressure hPa : 510  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 220  
Rack travel in m: 9.80...10.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 121.5...124.5  
1000 s: (118.0...128.0)  
Aneroid pressure h: -  
Speed rpm : 700

Del.quantity cm<sup>3</sup>/ : 79.0...81.0  
1000 s: (76.0...84.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 165.0...185.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.30...4.50  
Del.quantity cm<sup>3</sup>/ : 12.0...16.0  
1000 s: (-)  
Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 u1  
 Edition : 18.09.91  
 Replaces : 26.2.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 036 740  
 Injection pump  
 Pump designation : PES6P120A720/3LS3255  
 EP type number : 0 412 026 739  
 Governor  
 Governor design. : RQ300/1000PA813-13  
 Governor no. : 0 421 801 529

Customer-spec. information  
 Customer : MAN

Engine : D2866LF03  
 1st version kW : 273.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10  
 & maximum rack tra: 15.0...16.0  
 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 15.00...15.10  
 Del. quantity cm<sup>3</sup>/ : 24.2...24.4  
 100 s: (23.9...24.7)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 4.9...5.3  
 Del. quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 550  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del. quantity : 242.0...244.0  
 1000 : (239.0...247.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.80  
Speed rpm : 1045...1060  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.0

Testing:

Speed rpm : 200  
Minimum rack trave: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 700  
Rack travel in m: 15.30...15.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 110  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 470  
Rack travel in m: 13.70...14.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm3/ : 236.0...242.0  
1000 s: (233.0...245.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1045...1060

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.90...5.30  
Del.quantity cm3/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. G-7050

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : RVI 12,0 L  
 Edition : 02.08.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 828  
 Injection pump  
 Pump designation : PES6P120A320RS3288  
 EP type number : 0 412 026 750  
 Governor  
 Governor design. : RQV275...1000PA995-2  
 Governor no. : 0 421 813 940

Customer-spec. information

Customer : RVI  
 Engine : MIDR 063540 M/3

1st version kW : 236.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.35...3.45  
 : (3.30...3.50)  
 Rack travel in mm : 18.00...21.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 11.70...11.80  
 Del.quantity cm<sup>3</sup>/ : 22.4...22.6  
 100 s: (22.1...22.9)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.6...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1070  
 travel mm : 8.30...8.50  
 2nd speed rpm : 275  
 travel mm : 1.20...1.40  
 3rd speed rpm : 500  
 travel mm : 3.60...4.20  
 4th speed rpm : 750  
 travel mm : 5.70...6.10  
 5th speed rpm : 1450  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1180  
 Rack travel in mm : 9.40...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000  
 Del.quantity : 224.0...226.0  
 1000 : (221.0...229.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 296...304

#### Testing:

1st rack travel in: 10.70  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 244...252

#### Testing:

Speed rpm : 200  
Minimum rack travel: 6.80  
Speed rpm : 300  
Rack travel in mm : 4.70...4.90

#### CONSTANT REGULATION

Speed rpm : 310...420

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.70...11.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.60  
2nd pressure hPa : 280  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 160  
Rack travel in m: 10.00...10.20

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1000

G25

Del.quantity cm3/ : 210.0...216.0  
1000 s: (207.0...219.0)  
Speed rpm : 600  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 150.0...152.0  
1000 s: (147.0...155.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1065...1075

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...200.0  
1000 s: (166.0...204.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.60...5.00  
Del.quantity cm3/ : 16.0...22.0  
1000 s: (13.0...25.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : RVI 9,8 r  
 Edition : 21.08.91  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 046 829

Injection pump  
 Pump designation : PES6P120A320RS3284  
 EP type number : 0 412 026 749  
 Governor  
 Governor design. : RQV275...1050PA995-1  
 Governor no. : 0 421 813 941

Customer-spec. information  
 Customer : RVI

Engine : MIDR 062045 B/3

1st version kW : 186.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 700

---

Rack travel in mm : 10.50...10.60

---

Del.quantity cm3/ : 14.8...15.0  
 100 s: (14.5...15.3)

---

Spread cm3 : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 275.0  
 Rack travel in mm : 5.2...5.6  
 Del.quantity cm3/ : 2.0...2.6  
 100 s: (1.7...2.9)

Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1130  
 travel mm : 8.10...8.30  
 2nd speed rpm : 275  
 travel mm : 0.70...0.90  
 3rd speed rpm : 450  
 travel mm : 2.80...3.40  
 4th speed rpm : 750  
 travel mm : 5.50...5.90  
 5th speed rpm : 1450  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1270  
 Rack travel in mm : 9.20...11.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1000  
 Del.quantity : 148.0...150.0  
 1000 : (145.0...153.0)

Spread cm<sup>3</sup> : 5.00  
1000 s : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 296...304

Testing:  
1st rack travel in: 9.50  
Speed rpm : 1125...1135  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 243...251

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.90  
Speed rpm : 275  
Rack travel in mm : 5.40...5.50

#### CONSTANT REGULATION

Speed rpm : 340...440

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 10.50...10.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.40  
2nd pressure hPa : 200  
Rack travel in m: 9.90...10.00  
3rd pressure hPa : 140  
Rack travel in m: 9.50...9.70

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1050

Del.quantity cm<sup>3</sup>/ : 144.0...150.0  
1000 s : (141.0...153.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 105.0...107.0  
1000 s : (102.0...110.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.50  
Speed rpm : 1125...1135

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...155.0  
1000 s : (121.0...159.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.20...5.60  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s : (17.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s : (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 11,7 j 4  
 Edition : 30.08.91  
 Replaces : 2.8.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 831  
 Injection pump  
 Pump designation : PES6P110A720LS3282  
 EP type number : 0 412 016 736  
 Governor  
 Governor design. : RQ300/1100PA1015  
 Governor no. : 0 421 801 613

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 h

1st version kW : 157.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 13.6...13.8

100 s: (13.3...14.0)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 8.7...9.1

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.4

100 s: (0.8)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 13.50...14.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1100

Del.quantity : 136.0...138.0

1000 : (133.5...140.5)

Spread cm3 : 4.00

1000 : (8.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 14.0

Testing:

1st rack travel in: 12.00

Speed rpm : 1140...1150



2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1250  
Speed rpm : 0.00...2.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.3

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.80  
Speed rpm : 300  
Rack travel in mm : 7.20...7.40  
Rack travel in mm : 2.00  
Speed rpm : 370...410

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 113.0...116.0  
1000 s: (110.0...119.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 9,6 y 1  
 Edition : 27.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 832  
 Injection pump  
 Pump designation : PES6P110A72ORS3104  
 EP type number : 0 412 016 712  
 Governor  
 Governor design. : RQV350...1100PA850-6  
 Governor no. : 0 421 813 975

Customer spec. information  
 Customer : KHD

Engine : BF6L513RC

1st version kW : 200.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

H02

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 13.90...14.00  
 Del. quantity cm<sup>3</sup>/ : 16.3...16.5  
 100 s : (16.0...16.8)

Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 350.0  
 Rack travel in mm : 7.9...8.1  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.1  
 100 s : (1.4...2.4)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.10...1.30  
 2nd speed rpm : 410  
 travel mm : 2.60...3.20  
 3rd speed rpm : 590  
 travel mm : 3.90...4.50  
 4th speed rpm : 1160  
 travel mm : 8.60...8.80  
 5th speed rpm : 1215  
 travel mm : 9.80...10.20

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1190  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h : 550  
 Del. quantity : 163.0...165.0  
 1000 : (160.0...168.0)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 12.90  
Speed rpm : 1130...1140  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1310  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 86...94

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.50  
Speed rpm : 350  
Rack travel in mm : 7.90...8.10

CONSTANT REGULATION  
Speed rpm : 400...470

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 550  
Rack travel mm : 13.90...14.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 450  
Rack travel in m: 13.40...13.50  
3rd pressure hPa : 370  
Rack travel in m: 12.70...12.90

### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ : 123.0...125.0  
1000 s: (120.0...128.0)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (7.50)

### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1130...1140

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...200.0  
1000 s: (166.0...204.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 y 2  
Edition : 21.08.91  
Replaces : 19.3.91  
Test oil : ISO-4113

Combination no. : 0 402 076 742

Injection pump  
Pump designation : PES6P120A72ORS3203  
EP type number : 0 412 026 728  
Governor  
Governor design. : RSV400...1050P2A534-  
7  
Governor no. : 0 421 833 356

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6076 HZ030

1st version kW : 193.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x3.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

H04

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 15.4...15.6

100 s: (15.2...15.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 6.2...6.4

Del.quantity cm<sup>3</sup>/ : 3.0...3.6

100 s: (2.8...3.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 154.5...156.5

1000 : (152.5...158.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing:

1st rack travel in: 11.10  
Speed rpm : 1095...1105  
2nd rack travel in: 4.00  
Speed rpm : 1155...1165  
3rd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.8

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 6.20...6.40

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 700  
Rack travel in m: 13.60...13.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 375  
Rack travel in m: 11.20...11.60  
3rd pressure hPa : 590  
Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 188.5...194.5  
1000 s: (185.5...197.5)  
Aneroid pressure h: -  
Speed rpm : 800

H05

Del.quantity cm<sup>3</sup>/ : 116.5...120.5  
1000 s: (114.5...122.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.20...6.40  
Del.quantity cm<sup>3</sup>/ : 30.0...36.0  
1000 s: (28.0...38.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: JOHN DEERE # RE47549

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER 16,3 d2
Edition : 18.09.91
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 638 805
Injection pump
Pump designation : PE8P120A120RS7199
EP type number : 0 412 628 843
Governor
Governor design. : RQ750PA871-2
Governor no. : 0 421 801 627

Customer-spec. information
Customer : PERKINS (RR)

Engine : CV8-360 G

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 019
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test lines : 1 680 750 075
Outside diameter x Wall thickness x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 4.00...4.10
: (3.95...4.15)
Rack travel in mm : 9.00...12.00

H06

Firing order : 1- 3- 6- 5- 4- 8-
7- 2

Phasing : 0-45-90-135-180-225-
270-315
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
Rack travel in mm : 13.00...13.10
Del.quantity cm3/ : 36.2...36.4
100 s: (35.9...36.7)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 300.0
Rack travel in mm : 4.9...5.1
Del.quantity cm3/ : 3.6...4.2
100 s: (3.3...4.5)
Spread cm3 : 0.8
100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Del.quantity : 362.0...364.0
1000 : (359.0...367.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control Lever
position degrees: 87...95

Testing:
1st rack travel in: 12.00
Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 773...788
4th rack travel in: 900
Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 750...755

Remarks:

APPLICATION

Generator



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 22,0 a 1  
 Edition : 20.09.91  
 Replaces : 17.10.90  
 Test oil : ISO-4113

Combination no. : 0 402 640 821

Injection pump  
 Pump designation : PE12P120A520LS7814  
 EP type number : 0 412 620 813  
 Governor  
 Governor design. : RQV350...1050PA870-9  
 Governor no. : 0 421 813 873

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 588.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 : 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 13.50...13.70

Del.quantity cm<sup>3</sup>/ : 26.3...26.5

100 s: (26.0...26.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.9...5.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.80

2nd speed rpm : 600  
 travel mm : 3.30...3.80

3rd speed rpm : 900  
 travel mm : 5.40...5.90

4th speed rpm : 1100  
 travel mm : 7.60...8.10

5th speed rpm : 1200  
 travel mm : 9.60...10.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80



FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650  
Aneroid pressure h: 1100  
Del.quantity : 263.0...265.0  
1000 : (260.0...268.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 12.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 62...70

Testing:

Speed rpm : 250  
Minimum rack trave: 6.50  
Speed rpm : 350  
Rack travel in mm : 4.90...5.50

CONSTANT REGULATION

Speed rpm : 350...600

TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.40...13.60  
2nd speed rpm : 850  
Rack travel in m: 14.00...14.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 650  
Pressure hPa : 1100  
Rack travel mm : 13.50...13.70

Measurement

Speed 1/min : 650

1st pressure hPa : 500  
Rack travel in m: 9.60...9.80

H09

2nd pressure hPa : 700  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 1400  
Rack travel in m: 13.70...13.80  
4th pressure hPa : -  
Rack travel in m: 7.90...8.20

START CUT-OUT

Speed 1/min : 310 (330)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1050  
Del.quantity cm3/ : 261.0...264.0  
1000 s: (258.0...267.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1850  
Speed rpm : 850  
Del.quantity cm3/ : 278.0...282.0  
1000 s: (275.0...285.0)  
Spread cm3 : -  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 21,0 f2
Edition : 08.10.91
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 640 824
Injection pump
Pump designation : PE12P120A520LS7824-1
EP type number : 0 412 620 825
Governor
Governor design. : RQV300...1150PA977K
Governor no. : 0 421 815 265

Customer-spec. information
Customer : MAN

Engine : D2842LXF

1st version kW : 735.0
Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 019
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test lines : 1 680 750 067
Outside diameter x wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60
: (4.45...4.65)
Rack travel in mm : 9.00...12.00
Firing order : 12- 1- 5- 9- 8- 3-
: 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
: 180-225-240-285-300-
Phasing : 345
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150
Rack travel in mm : 13.70...13.80
Del.quantity cm3/ : 30.8...31.0
100 s: (30.5...31.3)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 300.0
Rack travel in mm : 5.0...5.4
Del.quantity cm3/ : 1.7...2.3
100 s: (1.4...2.6)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1195
travel mm : 10.10...10.30
2nd speed rpm : 300
travel mm : 1.00...1.20
3rd speed rpm : 550
travel mm : 3.40...4.00
4th speed rpm : 900
travel mm : 7.00...7.40
5th speed rpm : 1450
travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1215
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h : 1400  
Del.quantity : 308.0...310.0  
1000 : (305.0...313.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 295...303

Testing:  
1st rack travel in: 12.70  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 246...254

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 330...450

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 700  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 900  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1185  
Pressure hPa : 1400  
Rack travel mm : 13.70...13.80

Measurement  
Speed 1/min : 1185

1st pressure hPa : -  
Rack travel in m: 8.50...8.70  
2nd pressure hPa : 250

H11

Rack travel in m: 8.90...9.00  
3rd pressure hPa : 650  
Rack travel in m: 10.80...11.10

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 254.0...260.0  
1000 s: (251.0...263.0)  
Aneroid pressure h: 1400  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 285.0...291.0  
1000 s: (282.0...294.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 141.0...143.0  
1000 s: (138.0...146.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 255.0...275.0  
1000 s: (251.0...279.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.40  
Del.quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MAN-NR. 3-7024

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 12  
start of delivery

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar

atmospheric pressure.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 21,9 j 3  
 Edition : 18.09.91  
 Replaces : 28.3.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 826  
 Injection pump  
 Pump designation : PE12P120A320LS7813-2  
 EP type number : 0 412 620 826  
 Governor  
 Governor design. : RQ750PA966-3  
 Governor no. : 0 421 801 572

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 441.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 16.00...16.10

Del. quantity cm<sup>3</sup>/ : 28.0...28.2

100 s: (27.7...28.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del. quantity : 280.0...282.0

1000 : (277.0...285.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 86...94

Testing:

1st rack travel in: 15.00

Speed rpm : 755...760

2nd rack travel in: 4.00

Speed rpm : 785...795

4th rack travel in: 1000

Speed rpm : 0.00...1.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 15.00  
Speed rpm : 755...760

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 270.0...290.0  
1000 s: (266.0...294.0)

Remarks:

:

Observe VDT-I-420/120

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 21,0 f3  
Edition : 03.06.91  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 640 831  
  
Injection pump  
Pump designation : PE12P120A520LS7824-3  
EP type number : 0 412 620 829  
Governor  
Governor design. : RQV250...1150PA977K  
Governor no. : 0 421 815 265

Customer-spec. information  
Customer : MAN

Engine : D2842LXF

1st version kW : 735.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
                  : (4.45...4.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 12- 1- 5- 9- 8- 3-  
                  4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
                  180-225-240-285-300-  
Phasing : 345  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1150  

---

Rack travel in mm : 13.70...13.80  

---

Del. quantity cm3/ : 30.8...31.0  
100 s : (30.5...31.3)  

---

Spread cm3 : 0.5  
100 s : (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.0...5.4  
Del. quantity cm3/ : 1.7...2.3  
100 s : (1.4...2.6)  
Spread cm3 : 0.8  
100 s : (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1195  
travel mm : 10.10...10.30  
2nd speed rpm : 300  
travel mm : 1.00...1.20  
3rd speed rpm : 550  
travel mm : 3.40...4.00  
4th speed rpm : 900  
travel mm : 7.00...7.40  
5th speed rpm : 1450  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1215  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 308.0...310.0  
1000 : (305.0...313.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 295...303

#### Testing:

1st rack travel in: 12.70  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 246...254

#### Testing:

Speed rpm : 100  
Minimum rack trave: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30

#### CONSTANT REGULATION

Speed rpm : 330...450

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 700  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 900  
Rack travel in m: 13.00...13.20

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1150  
Pressure hPa : 1300  
Rack travel mm : 13.70...13.80

#### Measurement

Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 8.50...8.70  
2nd pressure hPa : 250

H16

Rack travel in m: 8.90...9.00  
3rd pressure hPa : 650  
Rack travel in m: 10.80...11.10

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1300  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 256.0...262.0  
1000 s: (253.0...265.0)  
Aneroid pressure h: 1300  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 285.0...291.0  
1000 s: (282.0...294.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 141.0...143.0  
1000 s: (138.0...146.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 255.0...275.0  
1000 s: (251.0...279.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.40  
Del.quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 3-7024

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 12  
start of delivery

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar



atmospheric pressure.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 21,0 f4  
 Edition : 08.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 831  
 Injection pump  
 Pump designation : PE12P120A520LS7824-3  
 EP type number : 0 412 620 829  
 Governor  
 Governor design. : RQV300...1150PA977K  
 Governor no. : 0 421 815 265

Customer-spec. information  
 Customer : MAN

Engine : D2842LXF

1st version kW : 735.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 1150  
 Rack travel in mm : 13.70...13.80  
 Del.quantity cm<sup>3</sup>/ : 30.8...31.0  
 100 s: (30.5...31.3)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.0...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**  
 1st speed rpm : 1195  
 travel mm : 10.10...10.30  
 2nd speed rpm : 300  
 travel mm : 1.00...1.20  
 3rd speed rpm : 550  
 travel mm : 3.40...4.00  
 4th speed rpm : 900  
 travel mm : 7.00...7.40  
 5th speed rpm : 1450  
 travel mm : 13.00...14.00

**GUIDE SLEEVE POSITION**  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1185  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1150  
Aneroid pressure h: 1400  
Del.quantity : 308.0...310.0  
1000 : (305.0...313.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 295...303

Testing:  
1st rack travel in: 12.70  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 246...254

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 330...450

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 700  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 900  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1150  
Pressure hPa : 1400  
Rack travel mm : 13.70...13.80

Measurement  
Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 8.50...8.70  
2nd pressure hPa : 250

Rack travel in m: 8.90...9.00  
3rd pressure hPa : 650  
Rack travel in m: 10.80...11.10

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 254.0...260.0  
1000 s: (251.0...263.0)  
Aneroid pressure h: 1400  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 285.0...291.0  
1000 s: (282.0...294.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 141.0...143.0  
1000 s: (138.0...146.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 255.0...275.0  
1000 s: (251.0...279.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.40  
Del.quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MAN-NR. 3-7024

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 12  
start of delivery

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar

atmospheric pressure.



H2O

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 21,9 x 3  
 Edition : 27.09.91  
 Replaces : 28.6.91  
 Test oil : ISO-4113

Combination no. : 0 402 640 835

Injection pump  
 Pump designation : PE12P120A320LS7807-4  
 EP type number : 0 412 620 830  
 Governor  
 Governor design. : RQV350...900PA870-15  
 Governor no. : 0 421 813 944

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 A

1st version kW : 375.0  
 Rated speed : 1800

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 900

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 17.9...18.1

100 s: (17.6...18.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.30...1.80

2nd speed rpm : 655  
 travel mm : 4.80...5.30

3rd speed rpm : 960  
 travel mm : 8.70...9.20

4th speed rpm : 1120  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 950

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1100  
Del. quantity : 179.0...181.0  
1000 : (176.0...184.0)  
Spread cm3 : 5.00  
1000 s : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 11.30  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 62...70

Testing:  
Speed rpm : 250  
Minimum rack travel: 6.80  
Speed rpm : 350  
Rack travel in mm : 5.20...5.80

CONSTANT REGULATION  
Speed rpm : 400...600

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 10.30...10.60

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 400  
Rack travel in m: 11.70...11.90

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 600  
Del. quantity cm3/ : 172.0...177.0  
1000 s : (169.0...180.0)  
Spread cm3 : 8.00  
1000 s : (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 136.0...138.0  
1000 s : (133.0...141.0)  
Spread cm3 : 8.00  
1000 s : (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 220.0...240.0  
1000 s : (216.0...244.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t13
Edition : 27.09.91
Replaces : 21.6.91
Test oil : ISO-4113
Combination no. : 0 402 646 838
Injection pump
Pump designation : PE6P120A320LS7808
EP type number : 0 412 626 816
Governor
Governor design. : RQ300/1050PA762-4
Governor no. : 0 421 801 390

Cust. part no. : T3

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 240.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm3/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.80  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 13.00  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

Testing:

Speed rpm : 200  
Minimum rack travel: 7.90  
Speed rpm : 300  
Rack travel in mm : 5.60...6.20  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.30  
2nd speed rpm : 1050  
Rack travel in m: 14.80...15.00  
3rd speed rpm : 800  
Rack travel in m: 15.00...15.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 550  
Rack travel in m: 12.90...13.10  
3rd pressure hPa : 1050  
Rack travel in m: 14.00...14.10 \*  
4th pressure hPa : 1150  
Rack travel in m: 14.40...14.70  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

START CUT-OUT

H24

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1450  
Speed rpm : 1050  
Del.quantity cm3/ : 236.0...239.0  
1000 s: (233.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1450  
Speed rpm : 800  
Del.quantity cm3/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

\* Increase in control-rod travel with respect to setting at least 0.1 mm



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : DAF 11,7 k6  
 Edition : 27.09.91  
 Replaces : 22.3.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 894  
 Injection pump  
 Pump designation : PE6P120A32ORS7194  
 EP type number : 0 412 626 834  
 Governor  
 Governor design. : RQ250/1000PA936  
 Governor no. : 0 421 801 507

Customer-spec. information  
 Customer : DAF

Engine : WS 295

1st version kW : 295.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance r - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del. quantity cm<sup>3</sup>/ : 23.9...24.1

100 s: (23.6...24.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del. quantity cm<sup>3</sup>/ : 2.2...2.8

100 s: (1.9...3.1)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del. quantity : 239.0...241.0

1000 : (236.0...244.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 12.70

Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 7.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.50  
Speed rpm : 250  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 345...385

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 1000  
Rack travel in m: 14.60...14.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 165.0...167.0  
1000 s: (162.0...170.0)

#### BREAKAWAY

#### 1st version

H26

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.90...7.10

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 j2
Edition : 27.09.91
Replaces : 6.7.90
Test oil : ISO-4113
Combination no. : 0 402 646 895
Injection pump
Pump designation : PE6P120A320RS7202
EP type number : 0 412 626 835
Governor
Governor design. : RQV250...1000PA939
Governor no. : 0 421 813 829

Customer-spec. information
Customer : DAF

Engine : WS 268

1st version kW : 268.0
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 105
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test lines : 1 680 750 089

Outside diameter x Wall thickness x Length mm : 8.00X2.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
(5.15...5.35)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850
Rack travel in mm : 11.90...12.00
Del. quantity cm3/ 100 s: (20.5...21.3)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 250.0
Rack travel in mm : 4.9...5.3
Del. quantity cm3/ 100 s: (1.8...3.0)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 0.70...1.10
2nd speed rpm : 400
travel mm : 2.50...3.10
3rd speed rpm : 700
travel mm : 4.50...4.90
4th speed rpm : 1045
travel mm : 7.80...8.00
5th speed rpm : 1350
travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1125
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 850
Aneroid pressure h: 1000

Del.quantity : 208.5...210.5  
1000 : (205.5...213.5)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 10.90  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1120...1150  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 74...82

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 270...380

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.90...12.00

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 320  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 190  
Rack travel in m: 10.10...10.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 145.5...147.5  
1000 s: (142.5...150.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 1030...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.30  
Del.quantity cm3/ : 21.0...27.0  
1000 s: (18.0...30.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 k4  
 Edition : 27.09.91  
 Replaces : 22.3.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 896

Injection pump  
 Pump designation : PE6P120A32ORS7194  
 EP type number : 0 412 626 834  
 Governor  
 Governor design. : RQV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information  
 Customer : DAF

Engine : WS 295

1st version kW : 295.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.25)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 23.9...24.1

100 s: (23.6...24.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del.quantity cm<sup>3</sup>/ : 2.2...2.8

100 s: (1.9...3.1)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.70...1.10

2nd speed rpm : 400  
 travel mm : 2.50...3.10

3rd speed rpm : 700  
 travel mm : 4.50...4.90

4th speed rpm : 1045  
 travel mm : 7.80...8.00

5th speed rpm : 1350  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del. quantity : 239.0...241.0  
1000 : (236.0...244.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 115...123

Testing:  
1st rack travel in: 12.70  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control Lever  
position degrees: 81...89

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.50  
Speed rpm : 250  
Rack travel in mm : 6.90...7.10

CONSTANT REGULATION  
Speed rpm : 275...385

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm3/ : 165.0...167.0  
1000 s: (162.0...170.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1030...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.90...7.10

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 L  
 Edition : 27.09.91  
 Replaces : 18.2.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 912

Injection pump  
 Pump designation : PE6P120A320RS7218  
 EP type number : 0 412 626 839  
 Governor  
 Governor design. : RQ250/1000PA936-1  
 Governor no. : 0 421 801 508

Customer-spec. information  
 Customer : DAF

Engine : WS 268 G

1st version kw : 268.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness : 8.00X2.50X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850

---

Rack travel in mm : 15.00...15.10

---

Del.quantity cm<sup>3</sup>/ : 23.4...23.6  
 100 s: (23.1...23.9)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del.quantity cm<sup>3</sup>/ : 2.8...3.4  
 100 s: (2.5...3.7)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 550  
 Rack travel in mm : 15.80...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000  
 Del.quantity : 234.0...236.0  
 1000 : (231.0...239.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version

Setting point:  
Speed rpm : 550  
Rack travel in mm : 16.4

Testing:  
1st rack travel in: 14.00  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.30...15.40  
2nd speed rpm : 1000  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.00...15.10

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 480  
Rack travel in m: 14.20...14.30  
3rd pressure hPa : 330  
Rack travel in m: 13.20...13.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 164.0...166.0  
1000 s: (161.0...169.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 9,6 q  
Edition : 21.08.91  
Replaces : 26.7.91  
Test oil : ISO-4113

Combination no. : 0 402 646 915

Injection pump  
Pump designation : PE6P120A320LS7836  
EP type number : 0 412 626 840  
Governor  
Governor design. : RQ300/1050PA972  
Governor no. : 0 421 801 542

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kw : 200.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
(5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
-360

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.40...12.60

Del. quantity cm<sup>3</sup>/ : 18.2...18.4

100 s : (17.9...18.7)

Spread cm<sup>3</sup> : 0.5

100 s : (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.8

Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s : (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s : (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del. quantity : 182.0...184.0  
1000 : (179.0...187.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.50...5.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 12.40...12.60

#### Measurement

Speed 1/min : 600  
1st pressure hPa : 250  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 500  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 1000  
Rack travel in m: 12.60...12.80  
4th pressure hPa : 1150  
Rack travel in m: 12.90...13.10  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1400  
Speed rpm : 1050  
Del.quantity cm3/ : 201.0...204.0  
1000 s: (198.0...207.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm3/ : 202.0...206.0  
1000 s: (199.0...209.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 1090...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 9.50...9.80

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 9,6 o  
 Edition : 30.08.91  
 Replaces : 24.4.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 917

Injection pump  
 Pump designation : PE6P120A320LS7834  
 EP type number : 0 412 626 841  
 Governor  
 Governor design. : RQ300/950PA971  
 Governor no. : 0 421 801 543

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 14.50...14.70

Del. quantity cm<sup>3</sup>/ : 22.7...22.9  
 100 s: (22.4...23.2)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.9  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1100  
 Del. quantity : 227.0...229.0  
 1000 : (224.0...232.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.90  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

Testing:

Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.30...6.90  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.35  
2nd speed rpm : 950  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1100  
Rack travel mm : 14.50...14.70

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 700  
Rack travel in m: 13.20...13.40  
3rd pressure hPa : 1400  
Rack travel in m: 14.60...14.80 \*  
4th pressure hPa : 1550  
Rack travel in m: 14.90...15.10  
5th pressure hPa : -  
Rack travel in m: 9.30...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1800  
Speed rpm : 950

Del.quantity cm3/ : 236.0...239.0  
1000 s: (233.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1800  
Speed rpm : 800  
Del.quantity cm3/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 990...1005

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 9,6 o 3  
 Edition : 30.08.91  
 Replaces : 26.4.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 929

Injection pump  
 Pump designation : PE6P120A320LS7834  
 EP type number : 0 412 626 841  
 Governor  
 Governor design. : RQV300...1050PA797  
 -25  
 Governor no. : 0 421 813 924

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 14.70...14.90

Del.quantity cm<sup>3</sup>/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...7.1

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.0...1.5

2nd speed rpm : 608  
 travel mm : 4.8...5.3

3rd speed rpm : 820  
 travel mm : 5.9...6.4

4th speed rpm : 1108  
 travel mm : 8.3...8.8

5th speed rpm : 1183  
 travel mm : 9.8...10.3

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1085

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1100  
Del.quantity : 229.0...231.0  
1000 : (226.0...234.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 120...128

Testing:  
1st rack travel in: 13.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 87...92

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.70  
Speed rpm : 300  
Rack travel in mm : 6.50...7.10

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.30...15.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1100  
Rack travel mm : 14.70...14.90

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.50...10.70  
2nd pressure hPa : 700  
Rack travel in m: 13.40...13.60

3rd pressure hPa : 1400  
Rack travel in m: 14.90...15.00  
4th pressure hPa : 1550  
Rack travel in m: 15.10...15.30  
5th pressure hPa : -  
Rack travel in m: 9.70...10.00

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1800  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 234.0...237.0  
1000 s: (231.0...240.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1800  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 n  
 Edition : 27.09.91  
 Replaces : 3.5.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 936  
 Injection pump  
 Pump designation : PE6P120A32ORS7230  
 EP type number : 0 412 626 843  
 Governor  
 Governor design. : RQV250...1000PA990K  
 Governor no. : 0 421 815 274

Customer-spec. information  
 Customer : DAF

Engine : WS 315 G

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 089  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 13.80...14.80

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 980  
 Rack travel in mm : 14.20...14.30  
 Del.quantity cm<sup>3</sup>/ : 26.4...26.6  
 100 s: (26.1...26.9)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 5.8...6.0  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.30...1.70  
 2nd speed rpm : 285  
 travel mm : 2.10...2.50  
 3rd speed rpm : 1030  
 travel mm : 9.60...10.00  
 4th speed rpm : 1145  
 travel mm : 11.20...11.40

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1070  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 980  
 Aneroid pressure h: 1500  
 Del.quantity : 264.0...266.0  
 1000 : (261.0...269.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 13.20  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1275  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 16...24

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 250  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 500  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 750  
Rack travel in m: 13.30...13.50  
4th speed rpm : 825  
Rack travel in m: 13.80...14.00  
5th speed rpm : 980  
Rack travel in m: 14.80...15.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 980  
Pressure hPa : 1500  
Rack travel mm : 14.20...14.30

Measurement  
Speed 1/min : 980

1st pressure hPa : —  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 630  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 340  
Rack travel in m: 9.90...10.10

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 288.0...292.0  
1000 s: (285.0...295.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: —  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 162.0...164.0  
1000 s: (159.0...167.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1030...1040

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.10...5.30

Remarks: :



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 L2  
Edition : 27.09.91  
Replaces : 21.6.91  
Test oil : ISO-4113  
Combination no. : 0 402 646 941  
Injection pump  
Pump designation : PE6P120A32ORS7218Z  
EP type number : 0 412 626 847  
Governor  
Governor design. : RQ250/1000PA936-1  
Governor no. : 0 421 801 508

Customer-spec. information  
Customer : DAF

Engine : WS 222 G

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
                  : (5.25...5.45)  
Rack travel in mm : 13.10...14.10

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 13.1...14.1  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.60...13.70

Del. quantity cm<sup>3</sup>/ : 19.6...19.8

100 s: (19.3...20.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.6...6.8

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del. quantity : 196.0...198.0

1000 : (193.0...201.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 12.60  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 990  
Rack travel in m: 14.50...14.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.60...13.70

Measurement

Speed 1/min : 600  
1st pressure hPa : -  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 390  
Rack travel in m: 13.30...13.40  
3rd pressure hPa : 310  
Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 161.0...163.0  
1000 s: (158.0...166.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 1040...1050

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,1 d  
 Edition : 18.09.91  
 Replaces : 27.5.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 942  
 Injection pump  
 Pump designation : PE6P120A320LS7837  
 EP type number : 0 412 626 842  
 Governor  
 Governor design. : RQ300/1050PA993  
 Governor no. : 0 421 801 581

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 14.70...14.90  
 Del.quantity cm<sup>3</sup>/ : 23.4...23.6  
 100 s: (23.1...23.9)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.0...6.6  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000  
 Del.quantity : 234.0...236.0  
 1000 : (231.0...239.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
1st rack travel in: 14.00  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.10  
Speed rpm : 300  
Rack travel in mm : 6.00...6.60  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL  
Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 15.00...15.20  
3rd speed rpm : 800  
Rack travel in m: 15.50...15.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.70...14.90

Measurement  
Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 9.70...9.90  
2nd pressure hPa : 600  
Rack travel in m: 13.50...13.70  
3rd pressure hPa : 1250  
Rack travel in m: 14.80...15.00 \*  
4th pressure hPa : 1400  
Rack travel in m: 15.30...15.50  
5th pressure hPa : -  
Rack travel in m: 9.30...9.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1800  
Speed rpm : 1050  
Del.quantity cm3/ : 235.0...238.0  
1000 s: (232.0...241.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1800  
Speed rpm : 800  
Del.quantity cm3/ : 248.0...252.0  
1000 s: (245.0...255.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI 13,8 h1  
 Edition : 18.09.91  
 Replaces : 22.3.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 946  
 Injection pump  
 Pump designation : PE6P130A720RS7225  
 EP type number : 0 412 636 817  
 Governor  
 Governor design. : RQV300...975PA1002K  
 Governor no. : 0 421 815 279

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8210.42.009

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 11.50...12.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975  
 Rack travel in mm : 11.90...12.00  
 Del.quantity cm<sup>3</sup>/ : 26.9...27.2  
 100 s : (26.5...27.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (1.0)

2nd speed rpm : 300.0  
 Rack travel in mm : 3.8...4.2  
 Del.quantity cm<sup>3</sup>/ : 1.9...2.5  
 100 s : (1.5...2.9)  
 Spread cm<sup>3</sup> : 1.0  
 100 s : (1.4)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1020  
 travel mm : 9.90...10.10  
 2nd speed rpm : 300  
 travel mm : 1.60...2.00  
 3rd speed rpm : 400  
 travel mm : 3.40...4.00  
 4th speed rpm : 600  
 travel mm : 5.20...5.60  
 5th speed rpm : 1250  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1045  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 975  
 Aneroid pressure h: 900  
 Del.quantity : 269.0...272.0  
 1000 : (265.5...275.5)

Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 10.90  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 100  
Minimum rack travel: 5.40  
Speed rpm : 300  
Rack travel in mm : 3.90...4.10

#### CONSTANT REGULATION

Speed rpm : 280...400

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 11.90...12.00  
2nd speed rpm : 800  
Rack travel in m: 11.60...11.80  
3rd speed rpm : 500  
Rack travel in m: 10.50...10.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 975  
Pressure hPa : 900  
Rack travel mm : 11.90...12.00

Measurement  
Speed 1/min : 975

1st pressure hPa : -  
Rack travel in m: 9.00...9.20  
2nd pressure hPa : 490  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 290  
Rack travel in m: 9.80...10.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 245.0...253.0  
1000 s: (241.5...256.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 196.0...199.0  
1000 s: (192.5...202.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.90  
Speed rpm : 1015...1025

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 125.0...155.0  
1000 s: (121.0...159.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm: 3.80...4.20  
Del. quantity cm<sup>3</sup>/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

#### Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : UNI 13,8 h2  
 Edition : 08.10.91  
 Replaces : 22.3.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 947

Injection pump  
 Pump designation : PE6P130A720RS7225  
 EP type number : 0 412 636 817  
 Governor  
 Governor design. : RQV300...950PA1002-1  
 K  
 Governor no. : 0 421 815 280

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8210.42.400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 12.50...13.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 950

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 30.6...30.9

100 s: (30.2...31.2)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 300.0

Rack travel in mm : 3.3...3.7

Del.quantity cm<sup>3</sup>/ : 1.9...2.5

100 s: (1.5...2.9)

Spread cm<sup>3</sup> : 1.0

100 s: (1.4)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 995  
 travel mm : 8.50...8.70

2nd speed rpm : 300  
 travel mm : 1.00...1.40

3rd speed rpm : 500  
 travel mm : 3.30...3.90

4th speed rpm : 750  
 travel mm : 5.80...6.20

5th speed rpm : 1300  
 travel mm : 13.00...14.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 950

Aneroid pressure h: 900

Del.quantity : 306.0...309.0

1000 : (302.5...312.5)

Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

#### Testing:

1st rack travel in: 11.50  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 62...70

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 3.40...3.60

#### CONSTANT REGULATION

Speed rpm : 340...460

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 750  
Rack travel in m: 12.40...12.60  
3rd speed rpm : 500  
Rack travel in m: 11.20...11.40  
4th speed rpm : 300  
Rack travel in m: 10.80...11.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 950  
Pressure hPa : 900  
Rack travel mm : 12.50...12.60

#### Measurement

Speed 1/min : 950

1st pressure hPa : -  
Rack travel in m: 8.60...8.80  
2nd pressure hPa : 560  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 350

J20

Rack travel in m: 9.40...9.80

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 273.0...279.0  
1000 s: (266.5...282.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 195.0...198.0  
1000 s: (191.5...201.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...155.0  
1000 s: (121.0...159.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.30...3.70  
Del.quantity cm<sup>3</sup>/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN 7,2 a  
 Edition : 21.08.91  
 Replaces : 26.7.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 948

Injection pump  
 Pump designation : PE6P12DA320RS7233-1  
 EP type number : 0 412 626 849  
 Governor  
 Governor design. : RGV300...1300PA1003K  
 Governor no. : 0 421 815 281

Customer-spec. information  
 Customer : PENTA

Engine : TAMD 72 A

1st version kW : 316.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40  
 : (3.25...3.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

---

Rack travel in mm : 14.60...14.70

---

Del.quantity cm3/ : 27.0...27.2  
 100 s: (26.7...27.5)

---

Spread cm3 : 0.6  
 100 s: (1.0)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.2  
 Del.quantity cm3/ : 2.0...2.6  
 100 s: (1.7...2.7)

Spread cm3 : 0.7  
 100 s: (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 2.00...2.40  
 2nd speed rpm : 550  
 travel mm : 4.00...4.60  
 3rd speed rpm : 1000  
 travel mm : 7.00...7.60  
 4th speed rpm : 1350  
 travel mm : 10.10...10.30  
 5th speed rpm : 1430  
 travel mm : 10.90...11.30

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1500  
 Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 2000

Del.quantity : 270.0...272.0  
1000 : (267.0...275.0)  
Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 13.60  
Speed rpm : 1330...1340  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 71...79

Testing:  
Speed rpm : 100  
Minimum rack trave: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 300...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 1200  
Rack travel in m: 14.00...14.30  
3rd speed rpm : 1000  
Rack travel in m: 12.50...13.00  
4th speed rpm : 800  
Rack travel in m: 12.10...12.30

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 1300  
Pressure hPa : 2000  
Rack travel mm : 14.60...14.70

Measurement  
Speed 1/min : 1300

1st pressure hPa : -  
Rack travel in m: 7.20...7.50  
2nd pressure hPa : 350

Rack travel in m: 7.40...7.50  
3rd pressure hPa : 1260  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 2000  
Speed rpm : 800  
Del.quantity cm3/ : 251.0...257.0  
1000 s: (248.0...260.0)  
Spread cm3 : 9.00  
1000 s: (13.0)  
Aneroid pressure h: -  
Speed rpm : 800  
Del.quantity cm3/ : 125.0...127.0  
1000 s: (122.0...130.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 1330...1340

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.40...5.60

#### Remarks:

:  
Start-of-delivery setting with ROBO  
diaphragm.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : DAF 11,7 n1  
 Edition : 27.09.91  
 Replaces : 21.6.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 949

Injection pump  
 Pump designation : PE6P120A32ORS7230Z  
 EP type number : 0 412 626 848  
 Governor  
 Governor design. : RQV250...1000PA990K  
 Governor no. : 0 421 815 274

Customer-spec. information  
 Customer : DAF

Engine : WS 295 G

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 13.20...14.20

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 980

---

Rack travel in mm : 13.70...13.80

---

Del.quantity cm<sup>3</sup>/ : 25.4...25.6

---

100 s: (25.1...25.9)

---

Spread cm<sup>3</sup> : 0.5

---

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.8...6.0

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.30...1.70

2nd speed rpm : 285  
 travel mm : 2.10...2.50

3rd speed rpm : 1030  
 travel mm : 9.60...10.00

4th speed rpm : 1145  
 travel mm : 11.20...11.40

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1070

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 980

Aneroid pressure h: 1500

Del.quantity : 254.0...256.0

1000 : (251.0...259.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Control lever

position degrees: 115...123

Testing:

1st rack travel in: 12.70

Speed rpm : 1030...1040

2nd rack travel in: 4.00

Speed rpm : 1135...1165

4th rack travel in: 1275

Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever

position degrees: 65...73

Testing:

Speed rpm : 100

Minimum rack travel: 6.70

Speed rpm : 250

Rack travel in mm : 5.10...5.30

Rack travel in mm : 2.00

Speed rpm : 320...360

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 500

Rack travel in m: 12.20...12.30

2nd speed rpm : 550

Rack travel in m: 12.20...12.40

3rd speed rpm : 725

Rack travel in m: 12.60...12.80

4th speed rpm : 850

Rack travel in m: 13.20...13.40

5th speed rpm : 980

Rack travel in m: 14.10...14.30

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 980

Pressure hPa : 1500

Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 980

1st pressure hPa : -

Rack travel in m: 8.10...8.30

2nd pressure hPa : 430

Rack travel in m: 10.80...10.90

3rd pressure hPa : 190

Rack travel in m: 9.10...9.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 500

Del.quantity cm3/ : 263.0...267.0

1000 s: (260.0...270.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm3/ : 143.0...145.0

1000 s: (140.0...148.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70

Speed rpm : 1030...1040

LOW IDLE

Speed rpm : 250

Rack travel in mm : 5.10...5.30

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 q 6  
 Edition : 08.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 952  
 Injection pump  
 Pump designation : PE6P120A320LS7836  
 EP type number : 0 412 626 840  
 Governor  
 Governor design. : RQ300/1050PA972-8  
 Governor no. : 0 421 801 626

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 11.70...11.90

Del. quantity cm<sup>3</sup>/ : 16.4...16.6

100 s: (16.1...16.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 700

Del. quantity : 164.0...166.0

1000 : (161.0...169.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.40  
Speed rpm : 300  
Rack travel in mm : 5.30...5.90  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.70...11.90

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 400  
Rack travel in m: 11.10...11.30  
3rd pressure hPa : 900  
Rack travel in m: 11.80...12.00 \*  
4th pressure hPa : -  
Rack travel in m: 9.80...10.10

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 182.0...185.0  
1000 s: (179.0...188.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 186.0...190.0  
1000 s: (183.0...193.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 10.00...10.30

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 9,6 g 7  
 Edition : 08.10.91  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 646 953

Injection pump  
 Pump designation : PE6P120A320LS7836  
 EP type number : 0 412 626 840  
 Governor  
 Governor design. : RQ300/950PA971-8  
 Governor no. : 0 421 801 625

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180.0  
 Rated speed : 1900

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 11.70...11.90

Del.quantity cm<sup>3</sup>/ : 16.4...16.6

100 s: (16.1...16.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 700

Del.quantity : 164.0...166.0

1000 : (161.0...169.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 11.50  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1100  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.40  
Speed rpm : 300  
Rack travel in mm : 5.30...5.90  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.70...11.90

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 400  
Rack travel in m: 11.10...11.30  
3rd pressure hPa : 900  
Rack travel in m: 11.80...12.00 \*  
4th pressure hPa : 1100  
Rack travel in m: 12.20...12.40  
5th pressure hPa : -  
Rack travel in m: 9.80...10.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 187.0...190.0  
1000 s: (184.0...193.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 190.0...194.0  
1000 s: (187.0...197.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 990...1005

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 10.00...10.30

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 o 6  
 Edition : 27.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 954  
 Injection pump  
 Pump designation : PE6P120A32OLS7834  
 EP type number : 0 412 626 841  
 Governor  
 Governor design. : RQ300/1050PA993-5  
 Governor no. : 0 421 801 610

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 213.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 13.70...13.90  
 Del.quantity cm<sup>3</sup>/ : 20.9...21.1  
 100 s: (20.6...21.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...7.0  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 800  
 Del.quantity : 209.0...211.0  
 1000 : (206.0...214.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.7

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.40...7.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL  
Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 800  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.70...13.90

Measurement  
Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 550  
Rack travel in m: 12.50...12.70  
3rd pressure hPa : 1100  
Rack travel in m: 13.80...14.00 \*  
4th pressure hPa : 1250  
Rack travel in m: 14.10...14.30  
5th pressure hPa : -  
Rack travel in m: 9.20...9.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 216.0...219.0  
1000 s: (213.0...222.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 219.0...223.0  
1000 s: (216.0...226.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 o 5  
 Edition : 20.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 955  
 Injection pump  
 Pump designation : PE6P120A320LS7834-1  
 EP type number : 0 412 626 857  
 Governor  
 Governor design. : RQV350...1050PA866  
 -13  
 Governor no. : 0 421 813 954

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm<sup>3</sup>/ : 22.2...22.4

100 s: (21.9...22.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.40...1.60

travel mm : 3.90...4.30

travel mm : 6.80...7.20

4th speed rpm : 1200

travel mm : 8.50...9.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 222.0...224.0  
1000 : (219.0...227.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 13.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.10...5.70

CONSTANT REGULATION  
Speed rpm : 350...600

TORQUE CONTROL  
Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 14.80...15.00  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.60...14.80

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.40...11.60  
2nd pressure hPa : 600  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1350  
Rack travel in m: 14.70...14.90 \*  
4th pressure hPa : -  
Rack travel in m: 9.60...9.90

K04

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1800  
Speed rpm : 1050  
Del.quantity cm3/ : 234.0...237.0  
1000 s: (231.0...240.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1800  
Speed rpm : 800  
Del.quantity cm3/ : 241.0...245.0  
1000 s: (238.0...248.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 125.0...127.0  
1000 s: (122.0...130.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 13.70  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 11,1 b 2  
 Edition : 08.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 956  
 Injection pump  
 Pump designation : PE6P120A320LS7837-1  
 EP type number : 0 412 626 858  
 Governor  
 Governor design. : RQV350...1050PA842-9  
 Governor no. : 0 421 813 955

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kw : 250.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.05)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 600

Rack travel in mm : 14.50...14.70

Del.quantity cm<sup>3</sup>/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350

travel mm : 1.40...1.60

travel mm : 3.90...4.30

travel mm : 6.80...7.20

4th speed rpm : 1200

travel mm : 8.50...9.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1185

Rack travel in mm : 16.50...18.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 234.0...236.0  
1000 : (231.0...239.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 111...119

#### Testing:

1st rack travel in: 13.50  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 63...71

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.10...5.70

#### CONSTANT REGULATION

Speed rpm : 350...600

#### TORQUE CONTROL

Dimension a mm : 0.60  
2nd speed rpm : 1050  
Rack travel in m: 14.50...14.70  
3rd speed rpm : 950  
Rack travel in m: 14.80...15.00  
4th speed rpm : 800  
Rack travel in m: 15.10...15.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.50...14.70

#### Measurement

Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 9.60...9.80  
2nd pressure hPa : 600  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1250  
Rack travel in m: 14.60...14.80 \*

4th pressure hPa : 1400  
Rack travel in m: 15.10...15.30  
5th pressure hPa : -  
Rack travel in m: 8.70...8.90

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1800  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 234.0...237.0  
1000 s: (231.0...240.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1800  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 247.0...251.0  
1000 s: (244.0...254.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 250.0...270.0  
1000 s: (246.0...274.0)

#### Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 r 2  
 Edition : 30.08.91  
 Replaces : 2.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 957

Injection pump  
 Pump designation : PE6P120A320LS7836  
 EP type number : 0 412 626 840  
 Governor  
 Governor design. : RQV300...1050PA797  
 -32  
 Governor no. : 0 421 813 957

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180,0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 11.70...11.90

Del. quantity cm<sup>3</sup>/ : 16.4...16.6

100 s: (16.1...16.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.50...1.00

2nd speed rpm : 830  
 travel mm : 5.90...6.40

3rd speed rpm : 1107  
 travel mm : 8.10...8.60

4th speed rpm : 1190  
 travel mm : 9.80...10.30

5th speed rpm : 1290  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 700  
Del. quantity : 164.0...166.0  
1000 : (161.0...169.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.40  
Speed rpm : 300  
Rack travel in mm : 5.30...5.90

#### CONSTANT REGULATION

Speed rpm : 300...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.70...11.90

Measurement  
Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 400  
Rack travel in m: 11.10...11.30  
3rd pressure hPa : 900  
Rack travel in m: 11.80...12.00 \*  
4th pressure hPa : 1100  
Rack travel in m: 12.10...12.30  
5th pressure hPa : -  
Rack travel in m: 10.00...10.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 182.0...185.0  
1000 s: (179.0...188.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 r 3  
 Edition : 30.08.91  
 Replaces : 2.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 958

Injection pump  
 Pump designation : PE6P120A320LS7836  
 EP type number : 0 412 626 840  
 Governor  
 Governor design. : RQV300...950PA797-33  
 Governor no. : 0 421 813 958

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 11.70...11.90

Del.quantity cm<sup>3</sup>/ : 16.4...16.6

100 s: (16.1...16.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 780  
 travel mm : 6.10...6.60

3rd speed rpm : 1008  
 travel mm : 8.30...8.80

4th speed rpm : 1092  
 travel mm : 11.00...10.30

5th speed rpm : 1190  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 700  
Del.quantity : 164.0...166.0  
1000 : (161.0...169.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 114...122

Testing:  
1st rack travel in: 11.50  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 78...86

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.40  
Speed rpm : 300  
Rack travel in mm : 5.30...5.90

CONSTANT REGULATION  
Speed rpm : 300...450

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.70...11.90

Measurement  
Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 400  
Rack travel in m: 11.10...11.30  
3rd pressure hPa : 900  
Rack travel in m: 11.80...12.00 \*  
4th pressure hPa : 1100  
Rack travel in m: 12.10...12.30  
5th pressure hPa : -  
Rack travel in m: 10.00...10.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 187.0...190.0  
1000 s: (184.0...193.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 189.0...193.0  
1000 s: (186.0...196.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 9,6 q 4  
 Edition : 30.08.91  
 Replaces : 2.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 959

Injection pump  
 Pump designation : PE6P120A320LS7836  
 EP type number : 0 412 626 840  
 Governor  
 Governor design. : RQ300/1050PA993-6  
 Governor no. : 0 421 801 616

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.40...12.60

Del.quantity cm<sup>3</sup>/ : 18.2...18.4

100 s: (17.9...18.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 182.0...184.0

1000 : (179.0...187.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.50...5.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 12.40...12.60

Measurement  
Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 500  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 1000  
Rack travel in m: 12.60...12.80  
4th pressure hPa : 1150  
Rack travel in m: 12.90...13.10  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 201.0...204.0  
1000 s: (198.0...207.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 q 5  
 Edition : 30.08.91  
 Replaces : 2.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 646 960

Injection pump  
 Pump designation : PE6P120A320LS7836  
 EP type number : 0 412 626 840  
 Governor  
 Governor design. : RQ300/950PA993-7  
 Governor no. : 0 421 801 617

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.40...12.60

Del. quantity cm<sup>3</sup>/ : 18.2...18.4

100 s: (17.9...18.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del. quantity : 182.0...184.0

1000 : (179.0...187.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.10  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:

Speed rpm : 200  
Minimum rack travel: 7.40  
Speed rpm : 300  
Rack travel in mm : 5.30...5.90  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 12.40...12.60

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 500  
Rack travel in m: 11.60...11.80  
3rd pressure hPa : 1000  
Rack travel in m: 12.60...12.80  
4th pressure hPa : 1150  
Rack travel in m: 12.90...13.10  
5th pressure hPa : -  
Rack travel in m: 10.00...10.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 950  
Del.quantity cm3/ : 203.0...206.0  
1000 s: (200.0...209.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm3/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN 16,2 c  
Edition : 08.10.91  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 962  
Injection pump  
Pump designation : PE6P130A720RS7137  
EP type number : 0 412 636 806  
Governor  
Governor design. : RQ750PA865-2  
Governor no. : 0 421 801 619

Customer-spec. information  
Customer : PENTA

Engine : TWD1620G

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 019  
Opening  
pressure, bar : 207...210  
Orifice plate  
diameter mm : 0,8  
Test lines : 1 680 750 067  
Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00

K15

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 38.6...38.9

100 s : (38.3...39.3)

Spread cm<sup>3</sup> : 0.6

100 s : (1.0)

2nd speed rpm : 700

Rack travel in mm : 3.7...4.1

Del.quantity cm<sup>3</sup>/ : 2.7...3.3

100 s : (2.4...3.6)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Del.quantity : 386.5...389.5

1000 : (383.0...393.0)

Spread cm<sup>3</sup> : 6.00

1000 : (10.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 86...94

### Testing:

1st rack travel in: 11.00

Speed rpm : 748...753

2nd rack travel in: 4.00

Speed rpm : 774...788

4th rack travel in: 850

Speed rpm : 0.00...1.00

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 11.00

Speed rpm : 748...753

HIGH IDLE

1st version

Speed rpm : 700  
Rack travel in mm : 3.70...4.10  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (24.0...36.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (8.00)

Remarks:

:

APPLICATION

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 L3  
 Edition : 27.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 963  
 Injection pump  
 Pump designation : PE6P120A32ORS7218Y  
 EP type number : 0 412 626 859  
 Governor  
 Governor design. : RQ250/1000PA936-1  
 Governor no. : 0 421 801 508

Customer-spec. information  
 Customer : DAF

Engine : WS 242 G

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 13.70...14.70

K17

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850  


---

 Rack travel in mm : 14.20...14.30  


---

 Del. quantity cm<sup>3</sup>/ : 21.3...21.5  


---

 100 s: (21.0...21.8)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)  


---

2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 550  
 Rack travel in mm : 15.80...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000  
 Del. quantity : 213.0...215.0  
 1000 : (210.0...218.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 16.4

Testing:  
1st rack travel in: 13.20  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.30...15.40  
2nd speed rpm : 1000  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.20...14.30

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 480  
Rack travel in m: 13.80...13.90  
3rd pressure hPa : 330  
Rack travel in m: 12.80...13.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 167.0...169.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : DAF 11,7 L4  
 Edition : 27.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 964  
 Injection pump  
 Pump designation : PE6P120A32ORS7218Y  
 EP type number : 0 412 626 859  
 Governor  
 Governor design. : RQV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information  
 Customer : DAF

Engine : WS 242 G

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 13.70...14.70

K19

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

**BASIC SETTING**

1st speed rpm : 850  
 Rack travel in mm : 14.20...14.30  
 Del. quantity cm<sup>3</sup>/ : 21.3...21.5  
 100 s: (21.0...21.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1045  
 travel mm : 7.80...8.00  
 2nd speed rpm : 250  
 travel mm : 0.70...1.10  
 3rd speed rpm : 400  
 travel mm : 2.50...3.10  
 4th speed rpm : 700  
 travel mm : 4.50...4.90  
 5th speed rpm : 1350  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Aneroid pressure h: 1000  
Del. quantity : 213.0...215.0  
1000 : (210.0...218.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: ?

Testing:  
1st rack travel in: 13.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 12...20

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 270...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.20...14.30

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 480  
Rack travel in m: 13.80...13.90  
3rd pressure hPa : 330  
Rack travel in m: 12.80...13.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -

Speed rpm : 600  
Del. quantity cm3/ : 167.0...169.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1040...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 14,7 a35  
 Edition : 18.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 817  
 Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQ300/1050PA762-16  
 Governor no. : 0 421 801 620

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A  
 1st version kW : 260.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 : 4- 1  
 Phasing : 0-45-90-135-180-225-  
 : 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 500  
 Rack travel in mm : 14.00...14.20  
 Del.quantity cm3/ : 20.4...20.6  
 100 s: (20.1...20.9)  
 Spread cm3 : 0.4  
 100 s: (0.7)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.0...6.4  
 Del.quantity cm3/ : 1.3...1.9  
 100 s: (1.0...2.2)  
 Spread cm3 : 0.5  
 100 s: (0.8)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 500  
 Aneroid pressure h: 1050  
 Del.quantity : 204.0...206.0  
 1000 : (201.0...209.0)  
 Spread cm3 : 4.00  
 1000 : (7.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.70  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.75  
2nd speed rpm : 1050  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 500  
Rack travel in m: 14.00...14.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 11.40...11.70

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 400  
Rack travel in m: 13.30...13.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm3/ : 178.0...181.0  
1000 s: (175.0...184.0)

Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 7.00  
1000 s: (10.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 14,7 a36  
 Edition : 18.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 825  
 Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQV300...1050PA797  
 -34  
 Governor no. : 0 421 813 973

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 500

Rack travel in mm : 14.00...14.20

Del.quantity cm3/ : 20.4...20.6

100 s: (20.1...20.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.5

100 s: (0.8)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300

travel mm : 1.20...1.40

2nd speed rpm : 600

travel mm : 4.90...5.10

3rd speed rpm : 1075

travel mm : 7.40...7.60

4th speed rpm : 1100

travel mm : 8.00...8.20

5th speed rpm : 1150

travel mm : 9.00...9.20

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500  
Aneroid pressure h: 1050  
Del.quantity : 204.0...206.0  
1000 : (201.0...209.0)  
Spread cm3 : 4.00  
1000 : (7.00)

RATED SPEED

1st version

Control lever position degrees: 114...122

Testing:

1st rack travel in: 11.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever position degrees: 80...88

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm : 1.40  
2nd speed rpm : 1050  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 500  
Rack travel in m: 14.00...14.20

Aneroid/Altitude Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 11.40...11.70

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 400

K24

Rack travel in m: 13.30...13.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm3/ : 178.0...181.0  
1000 s: (175.0...184.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 7.00  
1000 s: (10.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

:



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : FIA 17,2 e  
 Edition : 27.09.91  
 Replaces : 28.6.91  
 Test oil : ISO-4113

Combination no. : 0 402 648 854

Injection pump  
 Pump designation : PE8P130A920/5LS7822  
 EP type number : 0 412 638 802  
 Governor  
 Governor design. : RQV300...950PA905  
 Governor no. : 0 421 813 723

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8280.42.001

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 688 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
 : (5.05...5.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 4- 3- 6- 5-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 550

---

Rack travel in mm : 11.40...11.50

---

Del.quantity cm<sup>3</sup>/ : 22.8...23.1  
 100 s: (22.4...23.4)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.1...6.5  
 Del.quantity cm<sup>3</sup>/ : 2.0...2.6  
 100 s: (1.6...3.0)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 225  
 travel mm : 0.60...1.10

2nd speed rpm : 350  
 travel mm : 2.10...2.50

3rd speed rpm : 600  
 travel mm : 3.80...4.40

4th speed rpm : 950  
 travel mm : 7.20...7.40

5th speed rpm : 1200  
 travel mm : 11.00...12.00

**GUIDE SLEEVE POSITION**

Speed rpm : 1020  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 550  
 Aneroid pressure h: 900  
 Del.quantity : 228.0...231.0  
 1000 : (224.5...234.5)

Spread cm<sup>3</sup> : 8.00  
 1000 : (12.00)

## RATED SPEED

1st version

Control Lever  
position degrees: 109...117

Testing:

1st rack travel in: 10.40  
Speed rpm : 995...1005  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00.. 1.00

LOW IDLE 1

Control Lever  
position degrees: 63...71

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

Speed rpm : 380...480

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.70  
2nd pressure hPa : 440  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 400  
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 208.0...215.0  
1000 s: (204.5...218.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 168.0...171.0  
1000 s: (164.5...174.5)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 995...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...240.0  
1000 s: (206.0...244.0)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 a37  
 Edition : 18.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 882  
 Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQV300...950PA797-35  
 Governor no. : 0 421 813 974

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 269.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.00...14.20

Del. quantity cm<sup>3</sup>/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del. quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.50

2nd speed rpm : 600  
 travel mm : 4.80...5.30

3rd speed rpm : 950  
 travel mm : 7.60...8.10

4th speed rpm : 1050  
 travel mm : 9.00...9.50

5th speed rpm : 1100  
 travel mm : 9.90...10.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 990

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 500  
Aneroid pressure h: 1150  
Del.quantity : 203.0...205.0  
1000 : (200.0...208.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 11.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 84...92

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40

CONSTANT REGULATION  
Speed rpm : 300...500

TORQUE CONTROL  
Dimension a mm : 0.30  
2nd speed rpm : 950  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 500  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 10.60...11.00

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 500  
Rack travel in m: 12.60...12.80

K28

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1150  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 189.0...192.0  
1000 s: (186.0...195.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks: :

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,0 h5  
 Edition : 20.09.91  
 Replaces : 23.1.91  
 Test oil : ISO-4113

Combination no. : 0 402 648 883

Injection pump  
 Pump designation : PE8P120A920/4LS7125  
 EP type number : 0 412 628 833  
 Governor  
 Governor design. : RQV200...900PA795-11

Customer-spec. information  
 Customer : SCANIA

Engine : DS 14

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 13.50...13.60

---

Del. quantity cm<sup>3</sup>/ : 21.4...21.6  
 100 s: (21.1...21.9)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

---

2nd speed rpm : 300  
 Rack travel in mm : 4.5...5.1  
 Del. quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.40...1.80

2nd speed rpm : 350  
 travel mm : 1.90...2.50

3rd speed rpm : 650  
 travel mm : 4.80...5.20

4th speed rpm : 945  
 travel mm : 7.80...8.00

5th speed rpm : 1040  
 travel mm : 9.10...9.50

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1070  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del. quantity : 214.0...216.0  
 1000 : (211.0...219.0)

Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control Lever  
position degrees: 43...51

Testing:  
1st rack travel in: 12.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 11...19

Testing:  
Speed rpm : 100  
Minimum rack travel: 11.00  
Speed rpm : 300  
Rack travel in mm : 4.50...5.10  
Rack travel in mm : 2.00  
Speed rpm : 320...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.30...11.40  
2nd pressure hPa : 365  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 215  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 204.0...212.0  
1000 s: (202.0...214.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

BREAKAWAY

L02

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.50...5.10  
Del.quantity cm<sup>3</sup>/ : 15.0...19.0  
1000 s: (-)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 a38  
 Edition : 18.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 890  
 Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQ300/950PA932-5  
 Governor no. : 0 421 801 621

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 269.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.00...14.20

Del.quantity cm<sup>3</sup>/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 1150

Del.quantity : 203.0...205.0

1000 : (200.0...208.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.75  
2nd speed rpm : 950  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 800  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 10.60...11.00

Measurement

Speed 1/min : 600  
1st pressure hPa : 350  
Rack travel in m: 10.00...11.20  
2nd pressure hPa : 500  
Rack travel in m: 12.60...12.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1150  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 189.0...192.0  
1000 s: (186.0...195.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500

L04

Del.quantity cm<sup>3</sup>/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 990...1000

Remarks:

:



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 12,8 o  
 Edition : 27.09.91  
 Replaces : 30.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 648 893

Injection pump  
 Pump designation : PE8P120A320LS7835  
 EP type number : 0 412 628 847  
 Governor  
 Governor design. : RQ300/950PA971-2  
 Governor no. : 0 421 801 548

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)

Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 600

---

Rack travel in mm : 14.10...14.30

---

Del. quantity cm<sup>3</sup>/ : 22.5...22.7  
 100 s: (22.2...23.0)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.5  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000  
 Del. quantity : 225.0...227.0  
 1000 : (222.0...230.0)

---

Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.90  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 950  
Rack travel in m: 13.90...14.10  
3rd speed rpm : 800  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1200  
Rack travel in m: 14.20...14.40 \*  
4th pressure hPa : -  
Rack travel in m: 9.20...9.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 216.0...219.0  
1000 s: (213.0...222.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm<sup>3</sup> : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 34.0...40.0  
1000 s: (30.0...44.0)  
Rack travel in mm : 9.20...9.50

Remarks:

:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 12,8 o 1  
 Edition : 27.09.91  
 Replaces : 26.4.91  
 Test oil : ISO-4113

Combination no. : 0 402 648 894

Injection pump  
 Pump designation : PE8P120A320LS7835  
 EP type number : 0 412 628 847  
 Governor  
 Governor design. : RQV300...950PA797-18  
 Governor no. : 0 421 813 886

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 600

---

Rack travel in mm : 14.10...14.30

---

Del. quantity cm<sup>3</sup>/ : 22.5...22.7  
 100 s: (22.2...23.0)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.5  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 567  
 travel mm : 4.40...4.90

3rd speed rpm : 780  
 travel mm : 6.10...6.60

4th speed rpm : 1009  
 travel mm : 8.30...8.80

5th speed rpm : 1092  
 travel mm : 9.80...10.30

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 980

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1000  
Del. quantity : 225.0...227.0  
1000 : (222.0...230.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 122...130

Testing:  
1st rack travel in: 12.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50

CONSTANT REGULATION  
Speed rpm : 250...360

TORQUE CONTROL  
Dimension a mm : 0.50  
2nd speed rpm : 950  
Rack travel in m: 13.90...14.10  
3rd speed rpm : 800  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00

3rd pressure hPa : 1200  
Rack travel in m: 14.20...14.40 \*  
4th pressure hPa : -  
Rack travel in m: 9.20...9.50

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 216.0...219.0  
1000 s: (213.0...222.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 14,7 w 2  
 Edition : 18.09.91  
 Replaces : 28.3.91  
 Test oil : ISO-4113

Combination no. : 0 402 648 898

Injection pump  
 Pump designation : PE8P120A320LS7838  
 EP type number : 0 412 628 848  
 Governor  
 Governor design. : RQ300/950PA971-4  
 Governor no. : 0 421 801 558

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kw : 320.0  
 Rated speed : 1900

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 600

---

Rack travel in mm : 13.80...14.00

---

Del.quantity cm<sup>3</sup>/ : 22.3...22.5  
 100 s: (22.0...22.8)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 6.2...6.8  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 900  
 Del.quantity : 223.0...225.0  
 1000 : (220.0...228.0)

---

Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

**RATED SPEED**

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.50  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 950  
Rack travel in m: 14.50...14.70  
3rd speed rpm : 800  
Rack travel in m: 15.10...15.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.80...14.00

Measurement

Speed 1/min : 600  
1st pressure hPa : 350  
Rack travel in m: 10.10...10.30  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1100  
Rack travel in m: 13.90...14.10 \*  
4th pressure hPa : 1350  
Rack travel in m: 14.70...15.00  
5th pressure hPa : -  
Rack travel in m: 9.30...9.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 950

Del.quantity cm3/ : 234.0...237.0  
1000 s: (231.0...240.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 138.0...140.0  
1000 s: (135.0...143.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 990...1005

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 14,7 u 3  
 Edition : 18.09.91  
 Replaces : 3.5.91  
 Test oil : ISO-4113

Combination no. : 0 402 648 910

Injection pump  
 Pump designation : PE8P120A320LS7840  
 EP type number : 0 412 628 850  
 Governor  
 Governor design. : RGV300...950PA797-26  
 Governor no. : 0 421 813 915

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0  
 Rated speed : 1900

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.50...13.70

Del. quantity cm<sup>3</sup>/ : 20.6...20.8

100 s: (20.3...21.1)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.00...1.50

2nd speed rpm : 617

travel mm : 5.00...5.50

3rd speed rpm : 780

travel mm : 6.10...6.60

4th speed rpm : 1009

travel mm : 8.30...8.80

5th speed rpm : 1092

travel mm : 9.80...10.30

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h : 900  
Del.quantity : 206.0...208.0  
1000 : (203.0...211.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 12.40  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 82...90

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80

#### CONSTANT REGULATION

Speed rpm : 300...450

#### TORQUE CONTROL

Dimension a mm : 0.60  
2nd speed rpm : 950  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.20

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

#### Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00

3rd pressure hPa : 1050  
Rack travel in m: 13.60...13.70 \*  
4th pressure hPa : 1250  
Rack travel in m: 13.90...14.10  
5th pressure hPa : -  
Rack travel in m: 10.60...10.80

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 204.0...207.0  
1000 s: (201.0...210.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 220.0...224.0  
1000 s: (217.0...227.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 123.0...125.0  
1000 s: (120.0...128.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 12,8 o 4  
 Edition : 08.10.91  
 Replaces : 26.4.91  
 Test oil : ISO-4113

Combination no. : 0 402 648 915

Injection pump  
 Pump designation : PE8P120A320LS7835  
 EP type number : 0 412 628 847  
 Governor  
 Governor design. : RQ300/1050PA993-1  
 Governor no. : 0 421 801 582

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.80...15.00

Del.quantity cm<sup>3</sup>/ : 22.5...22.7

100 s: (22.2...23.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 225.0...227.0

1000 : (222.0...230.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.70  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.80...15.00

Measurement

Speed 1/min : 600  
1st pressure hPa : 250  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 650  
Rack travel in m: 13.60...13.80  
3rd pressure hPa : 1200  
Rack travel in m: 14.90...15.00 \*  
4th pressure hPa : -  
Rack travel in m: 9.60...9.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

L14

Aneroid pressure h: 1500  
Speed rpm : 1050  
Del.quantity cm3/ : 214.0...217.0  
1000 s: (211.0...220.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 232.0...236.0  
1000 s: (229.0...239.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 122.0...124.0  
1000 s: (119.0...127.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.70  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAN 14,5 e2  
 Edition : 28.06.91  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 916A

Injection pump  
 Pump designation : PE8P120A520LS7818-1  
 EP type number : 0 412 628 857  
 Governor  
 Governor design. : RQV250...1150PA902  
 Governor no. : 0 421 813 720

Cust. part no. : 2-7944

Customer-spec. information  
 Customer : MAN

Engine : D2848LXE 40

1st version kW : 500.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

L15

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

**BASIC SETTING**

1st speed rpm : 1050

---

Rack travel in mm : 12.80...12.90

---

Del. quantity cm<sup>3</sup>/ : 25.9...26.1  
 100 s : (25.6...26.4)

---

Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 500  
 Rack travel in mm : 8.9...9.1  
 Del. quantity cm<sup>3</sup>/ : 14.9...15.1  
 100 s : (14.6...15.4)

Spread cm<sup>3</sup> : -  
 100 s : (-)

3rd speed rpm : 250  
 Rack travel in mm : 7.30...7.50  
 Del. quantity cm<sup>3</sup>/ : 5.2...6.0 \*  
 100 s : (-)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.40...1.60

2nd speed rpm : 450  
 travel mm : 3.40...4.00

3rd speed rpm : 850  
 travel mm : 6.30...6.90

4th speed rpm : 1150  
 travel mm : 9.40...9.60

5th speed rpm : 1450  
 travel mm : 13.00...14.00

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1210

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050  
Aneroid pressure h: 1300  
Del.quantity : 259.0...261.0  
1000 : (256.0...264.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 11.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 80...88

Testing:

Speed rpm : 100  
Minimum rack trave: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 8.90...9.10  
2nd pressure hPa : 100  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 470  
Rack travel in m: 12.30...12.60

START CUT-OUT

Speed 1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100...120 \*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm3/ : 0 \*\*  
1000 s: (-)

HIGH IDLE

1st version

Speed rpm : 500  
Rack travel in mm : < 7.00  
Del.quantity cm3/ : 0 \*\*  
1000 s: (-)

2nd version

Speed rpm : 500  
Rack travel in mm : < 7.50  
Del.quantity cm3/ : < 50 \*\*  
1000 s: (-)

3rd version

Speed rpm : 500  
Rack travel in mm : 8.30...8.50  
Del.quantity cm3/ : 125... \*\*  
1000 s: (-)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 52.0...60.0 \*  
1000 s: (-)

Remarks:

:

\* applies to cylinders 2, 3, 4 and 8  
\*\* applies for cylinders 1, 5, 6, and 7

APPLICATION

Ship



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 x  
 Edition : 08.10.91  
 Replaces : 21.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 648 919

Injection pump  
 Pump designation : PE8P120A320LS7843  
 EP type number : 0 412 628 859  
 Governor  
 Governor design. : RQV350...1050PA842-8  
 Governor no. : 0 421 813 952

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.50...14.70

Del. quantity cm<sup>3</sup>/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.7...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 0.80...1.20

2nd speed rpm : 510  
 travel mm : 3.60...4.10

3rd speed rpm : 1100  
 travel mm : 7.80...8.40

4th speed rpm : 1270  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 16.50...18.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 1000  
Del.quantity : 229.0...231.0  
1000 : (226.0...234.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 100  
Minimum rack trave: 7.40  
Speed rpm : 350  
Rack travel in mm : 5.50...6.10

CONSTANT REGULATION  
Speed rpm : 350...550

TORQUE CONTROL  
Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 14.50...14.70  
3rd speed rpm : 800  
Rack travel in m: 14.80...15.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.50...14.70

Measurement  
Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 550  
Rack travel in m: 12.20...12.40  
3rd pressure hPa : 1250  
Rack travel in m: 14.60...14.80 \*

4th pressure hPa : -  
Rack travel in m: 9.20...9.50

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 1030  
Del.quantity cm<sup>3</sup>/ : 229.0...232.0  
1000 s: (226.0...235.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 236.0...240.0  
1000 s: (233.0...243.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 v 5  
 Edition : 30.08.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 921  
 Injection pump  
 Pump designation : PE8P120A320LS7839  
 EP type number : 0 412 628 849  
 Governor  
 Governor design. : RG300/950PA993-8  
 Governor no. : 0 421 801 618

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.00...15.10

Del. quantity cm<sup>3</sup>/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1050

Del. quantity : 256.0...258.0

1000 : (253.0...261.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600



Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.30  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 6.00...6.60  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1050  
Rack travel mm : 15.10...15.30

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 800  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1300  
Rack travel in m: 15.30...15.50  
4th pressure hPa : 1600  
Rack travel in m: 15.90...16.10  
5th pressure hPa : -  
Rack travel in m: 9.30...9.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1900  
Speed rpm : 950  
Del.quantity cm3/ : 279.0...282.0  
1000 s: (276.0...285.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1900  
Speed rpm : 800  
Del.quantity cm3/ : 283.0...287.0  
1000 s: (280.0...290.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.30  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 18,3 L 3  
 Edition : 27.09.91  
 Replaces : 21.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 649 810

Injection pump  
 Pump designation : PE10P120A320LS7809  
 EP type number : 0 412 629 800  
 Governor  
 Governor design. : RQV350...1050PA870-6  
 Governor no. : 0 421 813 766

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM443 LA

1st version kW : 401.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 130...150

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 10- 9- 4- 1- 8- 7  
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.30...14.50

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.2...6.8  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.90...2.10

2nd speed rpm : 700  
 travel mm : 4.10...4.50

3rd speed rpm : 1100  
 travel mm : 7.60...8.00

4th speed rpm : 1200  
 travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h : 800  
Del.quantity : 211.0...213.0  
1000 : (208.0...216.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 13.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.60  
Speed rpm : 350  
Rack travel in mm : 6.20...6.80

CONSTANT REGULATION  
Speed rpm : 300...400

TORQUE CONTROL  
Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 850  
Rack travel in m: 15.10...15.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 14.30...14.50

Measurement  
Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 550  
Rack travel in m: 13.20...13.40  
3rd pressure hPa : 960  
Rack travel in m: 14.40...14.50 \*

L23

4th pressure hPa : 1100  
Rack travel in m: 14.80...15.00  
5th pressure hPa : -  
Rack travel in m: 11.10...11.40

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1300  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 224.0...226.0  
1000 s: (221.0...229.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1300  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 232.0...236.0  
1000 s: (229.0...239.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1300  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 168.0...170.0  
1000 s: (165.0...173.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 132.0...136.0  
1000 s: (129.0...139.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (-)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.70  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 21,9 y 1  
 Edition : 18.09.91  
 Replaces : 13.12.89  
 Test oil : ISO-4113

Combination no. : 0 402 670 802

Injection pump  
 Pump designation : PE12P120A320LS7807  
 EP type number : 0 412 620 806  
 Governor  
 Governor design. : RSV350...750POA825-2  
 Governor no. : 0 421 833 250

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 A

1st version kW : 360.0  
 Rated speed : 1500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

**BASIC SETTING**

1st speed rpm : 700

---

Rack travel in mm : 14.40...14.50

---

Del.quantity cm<sup>3</sup>/ : 21.5...21.7

---

100 s: (21.2...22.0)

---

Spread cm<sup>3</sup> : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 5.4...5.9  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.40

Governor spring pre-tension  
 Click setting x : ?

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Del.quantity : 215.0...217.0  
 1000 : (212.0...220.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 23...31

Testing:  
1st rack travel in: 13.40  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 780...790  
4th rack travel in: 1000  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 9...17  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.3

Testing:  
Speed rpm : 100  
Minimum rack trave: 13.00  
Speed rpm : 350  
Rack travel in mm : 6.20...6.50

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm3/ : 212.0...218.0  
1000 s: (209.0...221.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.90  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (11.0...23.0)

Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
Observe VDT-I-420/120

APPLICATION

Generator

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAN 10,0 c1  
 Edition : 02.10.91  
 Replaces : 1.2.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 735 801  
 Injection pump  
 Pump designation : PES5P120A720/3LS7210  
 EP type number : 0 412 725 808  
 Governor  
 Governor design. : RGV325...1000PA960K  
 Governor no. : 0 421 815 247

Customer-spec. information  
 Customer : MAN

Engine : D2865LF03

1st version kW : 235.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 15.00...16.00  
 Firing order : 1-3-5-4-2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 4.40...4.60  
 & maximum rack tra: 15.0...16.0  
 Difference ° CS : 1.75...3.25

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 12.90...13.00

Del. quantity cm<sup>3</sup>/ : 24.4...24.6

100 s: (24.1...24.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 6.0...6.4

Del. quantity cm<sup>3</sup>/ : 4.7...5.3

100 s: (4.4...5.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1045  
 travel mm : 9.0...9.60

2nd speed rpm : 325  
 travel mm : 1.30...1.50

3rd speed rpm : 500  
 travel mm : 3.20...3.80

4th speed rpm : 900  
 travel mm : 7.60...8.00

5th speed rpm : 1350  
 travel mm : 13.00...14.00

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000  
Aneroid pressure h : 1200  
Del. quantity : 244.0...246.0  
1000 : (241.0...249.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 293...301

Testing:

1st rack travel in: 11.90  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 249...257

Testing:

Speed rpm : 100  
Minimum rack travel: 7.70  
Speed rpm : 325  
Rack travel in mm : 6.10...6.30

CONSTANT REGULATION

Speed rpm : 340...450

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 900  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 650  
Rack travel in m: 12.60...12.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.30...13.50

Measurement

Speed 1/min : 900

L28

1st pressure hPa : -  
Rack travel in m: 9.20...9.40  
2nd pressure hPa : 170  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 600  
Rack travel in m: 12.10...12.30

START CUT-OUT

Speed 1/min : 245 (265)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 900  
Del. quantity cm<sup>3</sup>/ : 261.0...265.0  
1000 s: (258.0...268.0)  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 264.0...270.0  
1000 s: (261.0...273.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 159.0...161.0  
1000 s: (156.0...164.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.00...6.40  
Del. quantity cm<sup>3</sup>/ : 47.0...53.0  
1000 s: (44.0...56.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7049

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 5  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 t 1  
 Edition : 08.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 805AA  
 Injection pump  
 Pump designation : PES6P12QA12ORS7206  
 EP type number : 0 412 726 835  
 Governor  
 Governor design. : RQV350...1100PA924  
 -5K  
 Governor no. : 0 421 815 250  
 Cust. part no. : 3281593  
 Customer-spec. information  
 Customer : CUMMINS  
 Engine : 6CTAA

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve  
 : 1 417 413 047  
 Overflow  
 quantity min. 1/h: 160...170  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1100  
 Rack travel in mm : 13.00...13.10  
 Del.quantity cm<sup>3</sup>/ : 17.3...17.5  
 100 s: (17.0...17.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.7...5.9  
 Del.quantity cm<sup>3</sup>/ : 3.3...3.9  
 100 s: (3.1...4.1)  
 Spread cm<sup>3</sup> : 0.7  
 100 s: (1.1)

**(B) Setting of injection pump  
 with governor**

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.10...1.50  
 2nd speed rpm : 550  
 travel mm : 3.40...4.00  
 3rd speed rpm : 900  
 travel mm : 6.10...6.70  
 4th speed rpm : 1150  
 travel mm : 8.40...8.60  
 5th speed rpm : 1250  
 travel mm : 9.40...9.80

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1420  
 Rack travel in mm : 6.00...12.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200



Del.quantity : 173.0...175.0  
1000 : (170.0...178.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 73...81

Testing:  
Speed rpm : 250  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION  
Speed rpm : 350...550

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 600  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 800  
Rack travel in m: 12.60...12.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.10

Measurement  
Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 9.30...9.50  
2nd pressure hPa : 600  
Rack travel in m: 11.10...11.30  
3rd pressure hPa : 425

MD3

Rack travel in m: 9.70...10.00

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 188.5...194.5  
1000 s: (185.5...197.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 137.0...141.0  
1000 s: (135.0...143.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 235.0...255.0  
1000 s: (231.0...259.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 33.0...39.0  
1000 s: (31.0...41.0)  
Spread cm<sup>3</sup> : 7.00  
1000 s: (11.00)

#### Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Start-of delivery mark/lock = 7.5° angular displacement of the cam after start of delivery of cylinder 1.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 5,9 w  
 Edition : 18.09.91  
 Replaces : 21.8.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 806  
 Injection pump  
 Pump designation : PES6P110A12ORS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964K  
 Governor no. : 0 421 815 252

Customer-spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kw : 171.5  
 Rated speed : 2500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1250

Rack travel in mm : 15.80...15.90

Del.quantity cm<sup>3</sup>/ : 16.8...17.0

100 s: (16.5...17.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 400

travel mm : 1.60...1.80

2nd speed rpm : 600

travel mm : 2.80...3.30

3rd speed rpm : 1300

travel mm : 7.20...7.40

4th speed rpm : 1500

travel mm : 8.90...9.30

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1250

Aneroid pressure h: 1500

Del.quantity : 168.5...170.5

1000 : (165.5...173.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 14.80  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...21

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 400  
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 15.80...15.90  
2nd speed rpm : 825  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 700  
Rack travel in m: 14.00...14.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1500  
Rack travel mm : 15.80...15.90

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 375  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 935  
Rack travel in m: 13.70...14.10

## START CUT-OUT

Speed 1/min : 300 (310)

MOS

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 825  
Del.quantity cm<sup>3</sup>/ : 178.0...184.0  
1000 s: (175.0...187.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 87.0...91.0  
1000 s: (85.0...93.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.80  
Speed rpm : 1290...1300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 12.40...13.40

## LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C # 3913440

Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 5,9 w 1  
 Edition : 18.09.91  
 Replaces : 21.8.91  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 736 810  
  
 Injection pump  
 Pump designation : PES6P110A12ORS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964-2  
 K  
 Governor no. : 0 421 815 254  
  
 Customer-spec. information  
 Customer : C.D.C.  
  
 Engine : 6BTA-A  
  
 1st version kW : 141.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve : 1 417 413 047  
  
 Inlet press., bar : 1.50  
  
 Overflow  
 quantity min. 1/h: 115...125  
  
 Test nozzle holder  
 assembly : 1 688 901 101  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,6  
  
 Test lines : 1 680 750 008  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24  
  
 Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4  
  
 Phasing : 0-60-120-180-240-300  
  
 Tolerance + - ° : 0.50 (0.75)  
  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250  


---

 Rack travel in mm : 14.80...14.90  


---

 Del.quantity cm<sup>3</sup>/ : 15.9...16.1  
 100 s: (15.6...16.4)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  


---

 2nd speed rpm : 400.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm<sup>3</sup>/ : 3.2...3.8  
 100 s: (3.0...4.0)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
 travel mm : 1.60...1.80  
 2nd speed rpm : 600  
 travel mm : 2.80...3.30  
 3rd speed rpm : 1300  
 travel mm : 7.20...7.40  
 4th speed rpm : 1500  
 travel mm : 8.90...9.30

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Aneroid pressure h: 1200  
 Del.quantity : 159.0...161.0  
 1000 : (156.0...164.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 13.80  
Speed rpm : 1295...1305  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 400  
Rack travel in mm : 5.40...5.60

### CONSTANT REGULATION

Speed rpm : 325...520

### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 800  
Rack travel in m: 13.10...13.30

### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 14.80...14.90

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 415  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 740  
Rack travel in m: 13.20...13.60

### START CUT-OUT

Speed 1/min : 290 (300)

M07

### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 158.0...164.0  
1000 s: (155.0...167.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 95.5...99.5  
1000 s: (93.5...101.5)

### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1295...1305

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 12.00...13.00

### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3919090

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 5,9 w 2  
 Edition : 18.09.91  
 Replaces : 21.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 736 811

Injection pump  
 Pump designation : PES6P110A12ORS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964-3  
 K  
 Governor no. : 0 421 815 255

Customer-spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 147.0  
 Rated speed : 2500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1250

Rack travel in mm : 14.80...14.90

Del.quantity cm<sup>3</sup>/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.5...5.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 400  
 travel mm : 1.60...1.80

2nd speed rpm : 600  
 travel mm : 2.80...3.30

3rd speed rpm : 1300  
 travel mm : 7.20...7.40

4th speed rpm : 1500  
 travel mm : 8.90...9.30

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1250

Aneroid pressure h: 1200

Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version  
Control Lever  
position degrees: 56...64

Testing:  
1st rack travel in: 13.80  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control Lever  
position degrees: 12...20

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 400  
Rack travel in mm : 5.50...5.70

### CONSTANT REGULATION

Speed rpm : 325...520

### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 800  
Rack travel in m: 13.20...13.40

### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 14.80...14.90

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 410  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 755  
Rack travel in m: 13.20...13.60

### START CUT-OUT

Speed 1/min : 290 (300)

M09

### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 156.5...162.5  
1000 s: (153.5...165.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1290...1300

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 11.90...12.90

### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.50...5.70  
Del. quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3918321

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 r 3  
 Edition : 18.09.91  
 Replaces : 15.11.90  
 Test oil : ISO-4113

Combination no. : 0 402 736 812

Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964-4  
 K  
 Governor no. : 0 421 815 256

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kw : 156.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow quantity min. 1/h: 115...125

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1200

---

Rack travel in mm : 12.60...12.70

---

Del. quantity cm<sup>3</sup>/ : 14.7...14.9  
 100 s: (14.4...15.2)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 5.7...5.9  
 Del. quantity cm<sup>3</sup>/ : 2.7...3.3  
 100 s: (2.5...3.5)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

**(B) Setting of injection pump with governor**

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.80...2.00

2nd speed rpm : 450  
 travel mm : 3.10...3.50

3rd speed rpm : 700  
 travel mm : 5.90...6.30

4th speed rpm : 1200  
 travel mm : 9.00...9.20

5th speed rpm : 1400  
 travel mm : 10.70...11.10

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 1200  
 Del. quantity : 147.5...149.5  
 1000 : (144.5...152.5)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 11.60  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1375...1405  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack trave: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 650  
Rack travel in m: 11.20...11.60  
3rd speed rpm : 550  
Rack travel in m: 11.10...11.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 1200

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 225  
Rack travel in m: 9.20...9.30  
3rd pressure hPa : 515  
Rack travel in m: 11.10...11.50

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 151.0...157.0  
1000 s: (148.0...160.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 11.00...12.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3917088

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Bow dimension:  
Sliding-sleeve position = 37.0 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 r 4  
 Edition : 18.09.91  
 Replaces : 21.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 736 813

Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1100PA964-5  
 K  
 Governor no. : 0 421 815 257

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 187.0  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 14.50...14.60

Del. quantity cm<sup>3</sup>/ : 18.6...18.8

100 s: (18.3...19.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.7...5.9  
 Del. quantity cm<sup>3</sup>/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.80...2.00

2nd speed rpm : 450  
 travel mm : 3.10...3.50

3rd speed rpm : 600  
 travel mm : 5.10...5.50

4th speed rpm : 1000  
 travel mm : 8.10...8.30

5th speed rpm : 1200  
 travel mm : 9.60...10.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del. quantity : 186.5...188.5  
 1000 : (183.5...191.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version

Control lever  
position degrees: 62...70

#### Testing:

1st rack travel in: 13.50  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

#### Testing:

Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 650  
Rack travel in m: 13.50...13.70  
3rd speed rpm : 500  
Rack travel in m: 12.90...13.30

#### Aneroid/Altitude Compensator Test

1st version

Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

#### Measurement

Speed 1/min : 1100  
1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 285  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 700  
Rack travel in m: 12.60...13.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 198.0...204.0  
1000 s: (195.0...207.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 98.0...102.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.80...11.80

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3916628

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

#### Bow dimension:

Sliding-sleeve position = 37.0 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 r 1  
 Edition : 18.09.91  
 Replaces : 21.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 736 814

Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964-6  
 K  
 Governor no. : 0 421 815 258

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 187.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1200

---

Rack travel in mm : 14.50...14.60

---

Del.quantity cm<sup>3</sup>/ : 18.3...18.5  
 100 s: (18.0...18.8)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm<sup>3</sup>/ : 2.7...3.3  
 100 s: (2.5...3.5)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.80...2.00

2nd speed rpm : 450  
 travel mm : 3.10...3.50

3rd speed rpm : 700  
 travel mm : 5.90...6.30

4th speed rpm : 1200  
 travel mm : 9.00...9.20

5th speed rpm : 1400  
 travel mm : 10.70...11.10

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 1200  
 Del.quantity : 183.0...185.0  
 1000 : (180.0...188.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1405...1435  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 650  
Rack travel in m: 11.60...12.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

#### Measurement

Speed 1/min : 1200

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 270  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 700  
Rack travel in m: 12.60...13.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 167.5...173.5  
1000 s: (164.5...176.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C # 3917089

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

#### Bow dimension:

Sliding-sleeve position = 37.0 mm

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 r 2  
 Edition : 18.09.91  
 Replaces : 21.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 736 816

Injection pump  
 Pump designation : PES6P110A12ORS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964-8  
 K  
 Governor no. : 0 421 815 264

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 213.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100

Rack travel in mm : 14.70...14.80

Del.quantity cm<sup>3</sup>/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 350  
 travel mm : 1.80...2.00

2nd speed rpm : 450  
 travel mm : 3.10...3.50

3rd speed rpm : 700  
 travel mm : 5.90...6.30

4th speed rpm : 1200  
 travel mm : 9.00...9.20

5th speed rpm : 1400  
 travel mm : 10.70...11.10

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del.quantity : 190.0...192.0  
 1000 : (187.0...195.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.20  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 650  
Rack travel in m: 12.60...13.00  
3rd speed rpm : 1200  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 14.70...14.80

Measurement  
Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 295  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 745  
Rack travel in m: 12.80...13.20

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 181.0...187.0  
1000 s: (178.0...190.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del. quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C # 3916626

Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

Bow dimension:  
Sliding-sleeve position = 37.0 mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MAC 11,1 a  
 Edition : 08.10.91  
 Replaces : 4.9.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 746 810  
  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848K  
 Governor no. : 0 421 815 168

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 350 4VH

1st version kW : 261.0  
 Rated speed : 1800

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.0...4.2

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40

2nd speed rpm : 450  
travel mm : 3.10...3.30

3rd speed rpm : 850  
travel mm : 5.90...6.10

4th speed rpm : 1000  
travel mm : 7.50...7.70

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 236.5...238.5

1000 : (233.5...241.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)



## RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 12.90  
Speed rpm : 950...980  
2nd rack travel in: 4.00  
Speed rpm : 1085...1095  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.00...4.20

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 625  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.10  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 275  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570  
Rack travel in m: 12.30...12.70

## FUEL DELIVERY CHARACTERISTICS

M19

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 257.0...263.0  
1000 s: (254.0...266.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 950...980

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 8.50...8.90

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.00...4.20  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173P10

Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER 12,2 e2  
 Edition : 18.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 844  
 Injection pump  
 Pump designation : PES6P120A32ORS7162  
 EP type number : 0 412 726 819  
 Governor  
 Governor design. : RQ750PA836-2  
 Governor no. : 0 421 801 628

Customer-spec. information  
 Customer : PERKINS

Engine : 2006 TAG

1st version kw : 280.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del. quantity cm<sup>3</sup>/ : 37.9...38.1

100 s: (37.6...38.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.7

Del. quantity cm<sup>3</sup>/ : 3.8...4.4

100 s: (3.5...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del. quantity : 379.0...381.0

1000 : (376.0...384.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 85...93

Testing:

1st rack travel in: 12.00

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 780...793

4th rack travel in: 820

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 300.0...340.0  
1000 s: (296.0...344.0)

Remarks:

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 6,2 h  
Edition : 08.10.91  
Replaces : 21.6.91  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 883  
  
Injection pump  
Pump designation : PES6P110A32ORS7198  
EP type number : 0 412 716 802  
Governor  
Governor design. : RQV275...1250PA942K  
Governor no. : 0 421 815 234

Customer spec. information  
Customer : RVI

Engine : MIDR06-06-26

1st version kW : 132.5  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.60...4.70  
: (4.55...4.75)  
Rack travel in mm : 12.50...13.50

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.50...14.60

Del.quantity cm<sup>3</sup>/ : 15.4...15.6

100 s: (15.1...15.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 5.0...5.4

Del.quantity cm<sup>3</sup>/ : 1.8...2.3

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 9.70...9.90

2nd speed rpm : 275

travel mm : 0.90...1.10

3rd speed rpm : 600

travel mm : 4.20...4.60

4th speed rpm : 1000

travel mm : 7.10...7.50

5th speed rpm : 1600

travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1370

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1000

Del.quantity : 154.0...156.0

1000 : (151.5...158.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1315...1325  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.00  
Speed rpm : 275  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 350...480

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 750  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 300  
Rack travel in m: 12.80...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 360  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 220  
Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 119.0...123.0  
1000 s: (116.0...126.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 67.0...69.0  
1000 s: (64.5...71.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1315...1325

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...115.0  
1000 s: (81.0...119.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.00...5.40  
Del.quantity cm<sup>3</sup>/ : 18.0...23.0  
1000 s: (15.5...25.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h6  
 Edition : 18.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 887AA  
 Injection pump  
 Pump designation : PES6P120A72ORS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...975PA944-2K  
 Governor no. : 0 421 815 237

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-275A

1st version kW : 205.0  
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975  
 Rack travel in mm : 13.20...13.30  
 Del.quantity cm<sup>3</sup>/ : 23.0...23.2  
 100 s: (22.7...23.5)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 340.0  
 Rack travel in mm : 4.8...5.0  
 Del.quantity cm<sup>3</sup>/ : 3.1...3.7  
 100 s: (2.9...3.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.40...1.60  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 950  
 travel mm : 7.90...8.10  
 4th speed rpm : 1200  
 travel mm : 10.20...10.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 975  
 Aneroid pressure h: 1200  
 Del.quantity : 230.5...232.5  
 1000 : (227.5...235.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1015...1045  
2nd rack travel in: 4.00  
Speed rpm : 1180...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 600  
Rack travel in m: 12.30...12.50  
3rd speed rpm : 500  
Rack travel in m: 11.50...11.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 975  
Pressure hPa : 1200  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 975

1st pressure hPa : -  
Rack travel in m: 8.40...8.80  
2nd pressure hPa : 350  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 660  
Rack travel in m: 11.90...12.30

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 244.0...250.0  
1000 s: (241.0...253.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (180.5...207.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1015...1045

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 31.0...37.0  
1000 s: (29.0...39.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,

check value for engine equipment.





**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 12,0 m  
 Edition : 18.06.91  
 Replaces : 13.5.91  
 Test oil : ISO-4113

Combination no. : 0 402 746 911

Injection pump  
 Pump designation : PES6P120A72ORS7239  
 EP type number : 0 412 726 850  
 Governor  
 Governor design. : RQV325...900PA944-13  
 K  
 Governor no. : 0 421 815 284

Customer spec. information  
 Customer : MACK TRUCKS

Engine : E7-350 ITC

1st version kW : 261.0  
 Rated speed : 1800

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow quantity min. 1/h: 160...170

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

M27

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900

---

Rack travel in mm : 12.80...12.90

---

Del. quantity cm<sup>3</sup>/ : 23.1...23.3  
 100 s: (22.8...23.6)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 325.0  
 Rack travel in mm : 5.0...5.2  
 Del. quantity cm<sup>3</sup>/ : 4.6...5.2  
 100 s: (4.4...5.4)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.70...3.20

3rd speed rpm : 650  
 travel mm : 5.60...5.80

4th speed rpm : 900  
 travel mm : 8.30...8.50

5th speed rpm : 1100  
 travel mm : 10.30...10.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del. quantity : 231.5...233.5  
 1000 : (228.5...236.5)

---

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control Lever  
position degrees: 58...66

Testing:  
1st rack travel in: 11.80  
Speed rpm : 940...990  
2nd rack travel in: 4.00  
Speed rpm : 1090...1100  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.20  
Speed rpm : 325  
Rack travel in mm : 5.00...5.20

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 625  
Rack travel in m: 12.70...13.00  
3rd speed rpm : 550  
Rack travel in m: 11.80...12.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 12.70...13.00

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 7.40...7.80  
2nd pressure hPa : 365  
Rack travel in m: 8.90...9.00  
3rd pressure hPa : 665  
Rack travel in m: 11.30...11.70

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 266.5...272.5  
1000 s: (263.5...275.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (180.5...207.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 147.5...151.5  
1000 s: (145.5...153.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 940...990

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...240.0  
1000 s: (205.0...245.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 46.5...52.5  
1000 s: (44.5...54.5)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5203-P8

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 12,0 m1  
 Edition : 18.06.91  
 Replaces : 13.5.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 912  
 Injection pump  
 Pump designation : PES6P120A720RS7239  
 EP type number : 0 412 726 850  
 Governor  
 Governor design. : RQV325...875PA944-14  
 K  
 Governor no. : 0 421 815 285

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-300 ITC

1st version kW : 224.0  
 Rated speed : 1750

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

NO2

Test pressure, bar: 22...24  
 Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875  
 Rack travel in mm : 11.20...11.30  
 Del. quantity cm<sup>3</sup>/ : 21.6...21.8  
 100 s: (21.3...22.1)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.4...4.6  
 Del. quantity cm<sup>3</sup>/ : 4.6...5.2  
 100 s: (4.4...5.4)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.70...1.90  
 2nd speed rpm : 450  
 travel mm : 4.20...4.60  
 3rd speed rpm : 650  
 travel mm : 8.00...8.40  
 4th speed rpm : 900  
 travel mm : 10.00...10.20  
 5th speed rpm : 1000  
 travel mm : 10.80...11.20

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del. quantity : 216.5...218.5  
 1000 : (213.5...221.5)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 63...71

Testing:  
1st rack travel in: 10.20  
Speed rpm : 915...965  
2nd rack travel in: 4.00  
Speed rpm : 1015...1025  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.40...4.60

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 510  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 450  
Rack travel in m: 11.80...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 12.90...13.10

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 7.10...7.50  
2nd pressure hPa : 370  
Rack travel in m: 8.70...8.80  
3rd pressure hPa : 730  
Rack travel in m: 11.50...11.90

START CUT-OUT

N03

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 315.5...321.5  
1000 s: (312.5...324.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (159.5...183.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 160.0...164.0  
1000 s: (158.0...166.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 915...965

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...240.0  
1000 s: (205.0...245.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.40...4.60  
Del.quantity cm3/ : 46.0...52.0  
1000 s: (44.0...54.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5203-P6

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : BAO 15,9 d  
 Edition : 27.09.91  
 Replaces : 21.8.91  
 Test oil : ISO-4113

Combination no. : 0 402 746 920

Injection pump  
 Pump designation : PES6P120A32ORS7241  
 EP type number : 0 412 726 854  
 Governor  
 Governor design. : RQV350...900PA935-1  
 Governor no. : 0 421 813 820

Customer-spec. information  
 Customer : BAUDOVIN

Engine : 6P15 2E

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 074

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00

N05

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

---

Rack travel in mm : 12.00...12.10

---

Del.quantity cm<sup>3</sup>/ : 33.9...34.1  
 100 s: (33.6...34.4)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.7...5.1  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 945  
 travel mm : 8.40...8.60

2nd speed rpm : 350  
 travel mm : 1.30...1.70

3rd speed rpm : 550  
 travel mm : 3.60...4.20

4th speed rpm : 750  
 travel mm : 5.90...6.30

5th speed rpm : 1200  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 940

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 339.0...341.0  
 1000 : (336.0...344.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 119...127

Testing:  
1st rack travel in: 11.00  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 83...91

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 350  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 350...450

START CUT-OUT

Speed 1/min : 270 (290)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 940...950

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,8 v  
 Edition : 27.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 921  
 Injection pump  
 Pump designation : PES6P120A720LS7242  
 EP type number : 0 412 726 856  
 Governor  
 Governor design. : RQ300/1050PA774-5  
 Governor no. : 0 421 801 608

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 LA

1st version kW : 306.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.50...15.70

Del.quantity cm<sup>3</sup>/ : 27.4...27.6

100 s: (27.1...27.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 274.0...276.0

1000 : (271.0...279.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.70  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0  
Speed rpm : 300  
Rack travel in mm : 5.80...6.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 15.70...15.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.50...15.70

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 700  
Rack travel in m: 14.30...14.50  
3rd pressure hPa : 1300  
Rack travel in m: 15.70...15.90  
4th pressure hPa : 1450  
Rack travel in m: 16.20...16.40  
5th pressure hPa : -  
Rack travel in m: 10.30...10.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 269.0...272.0  
1000 s: (266.0...275.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 700  
Del.quantity cm3/ : 297.0...301.0  
1000 s: (294.0...304.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 143.0...145.0  
1000 s: (140.0...148.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.70  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 11,8 u 3  
 Edition : 27.09.91  
 Replaces : -  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 746 923  
  
 Injection pump  
 Pump designation : PES6P120A720LS7237  
 EP type number : 0 412 726 851  
 Governor  
 Governor design. : RQ300/1100PA1013-2  
 Governor no. : 0 421 801 611

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 ha

1st version kW : 184.0  
 Rated speed : 2200

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x10.50

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.00...12.20

Del. quantity cm<sup>3</sup>/ : 16.3...16.5

100 s : (16.0...16.8)

Spread cm<sup>3</sup> : 0.5

100 s : (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s : (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s : (1.2)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 500

Del. quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.30  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.60...6.20  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 500  
Rack travel mm : 12.00...12.20

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.60...11.80  
2nd pressure hPa : 600  
Rack travel in m: 12.20...12.40  
3rd pressure hPa : 770  
Rack travel in m: 12.80...13.00  
4th pressure hPa : -  
Rack travel in m: 11.40...11.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1400  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 199.0...202.0  
1000 s: (196.0...205.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 800

N10

Del.quantity cm<sup>3</sup>/ : 203.0...207.0  
1000 s: (200.0...210.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 139.0...141.0  
1000 s: (136.0...144.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.30  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 L  
 Edition : 08.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 924  
 Injection pump  
 Pump designation : PES6P110A320RS7243  
 EP type number : 0 412 716 806  
 Governor  
 Governor design. : RGV275...1250PA942-2  
 K  
 Governor no. : 0 421 815 288

Customer-spec. information  
 Customer : RVI

Engine : MIDR06-06-26 L/2

1st version kW : 132.5  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 172...175

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.60...4.70  
 : (4.55...4.75)  
 Rack travel in mm : 12.50...13.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 11.10...11.20  
 Del.quantity cm<sup>3</sup>/ : 13.9...14.1  
 100 s: (13.9...14.1)

2nd speed rpm : 275.0  
 Rack travel in mm : 4.50...4.90  
 Del.quantity cm<sup>3</sup>/ : 2.2...2.7  
 100 s: (2.2...2.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1320  
 travel mm : 9.70...9.90  
 2nd speed rpm : 275  
 travel mm : 0.90...1.10  
 3rd speed rpm : 600  
 travel mm : 4.20...4.60  
 4th speed rpm : 1000  
 travel mm : 7.00...7.40  
 5th speed rpm : 1600  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1470  
 Rack travel in mm : 8.80...11.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Aneroid pressure h: 1000  
 Del.quantity : 139.0...141.0  
 1000 : (139.0...141.0)

RATED SPEED

1st version  
Control lever  
position degrees: 269...277

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1315...1325  
2nd rack travel in: 4.00  
Speed rpm : 1435...1465  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 219...227

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.30  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 350...480

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 650  
Rack travel in m: 10.10...10.30  
3rd speed rpm : 300  
Rack travel in m: 9.40...9.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 11.10...11.20

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 8.40...8.60  
2nd pressure hPa : 240  
Rack travel in m: 9.20...9.30  
3rd pressure hPa : 160  
Rack travel in m: 8.60...9.00

START CUT-OUT

Speed 1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

M12

1st version  
Aneroid pressure h: 1000  
Speed rpm : 650  
Del.quantity cm3/ : 126.0...130.0  
1000 s: (126.0...130.0)  
Speed rpm : 650  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 79.0...81.0  
1000 s: (79.0...81.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1315...1325

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...120.0  
1000 s: (96.0...124.0)

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.50...4.90  
Del.quantity cm3/ : 22.0...27.0  
1000 s: (22.0...27.0)

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : DEE 7,7 n  
 Edition : 18.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 776 808  
 Injection pump  
 Pump designation : PES6P120A720RS7223  
 EP type number : 0 412 726 843  
 Governor  
 Governor design. : RSV400...1050POA547  
 Governor no. : 0 421 833 349

Customer spec. information  
 Customer : JOHN DEERE

Engine : 6101 HZ010

1st version kW : 241.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 075

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 140...150

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 27...29  
 Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 25.9...26.1

100 s: (25.6...26.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 6.1...6.3

Del.quantity cm<sup>3</sup>/ : 2.0...2.6

100 s: (1.8...2.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1050

Aneroid pressure h: 1200

Del.quantity : 259.5...261.5

1000 : (256.5...264.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 39...47

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1165  
3rd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.2

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.60...5.80

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 800  
Rack travel in m: 13.30...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.30...13.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.80...10.90  
2nd pressure hPa : 390  
Rack travel in m: 11.60...11.70  
3rd pressure hPa : 700  
Rack travel in m: 12.60...13.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 279.0...285.0  
1000 s: (276.0...288.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 147.5...151.5  
1000 s: (145.5...153.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 95.0...135.0  
1000 s: (90.0...140.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.10...6.30  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (18.0...28.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:  
Adjustment without torque-control E47014  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : VOL 7,1 f  
 Edition : 18.09.91  
 Replaces : 24.4.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 846 050  
 Injection pump  
 Pump designation : PE6P110A32ORS8009  
 EP type number : 0 412 816 010  
 Governor  
 Governor design. : RQV250...1200PA953K  
 Governor no. : 0 421 815 996

Customer-spec. information  
 Customer : VOLVO-TRUCK

Engine : TD73EB

1st version kW : 184.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 064

Inlet press., bar : 2.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90  
 : (3.75...3.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1200

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 16.4...16.6

100 s: (16.2...16.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.7...5.1

Del.quantity cm<sup>3</sup>/ : 2.1...2.5

100 s: (1.8...2.8)

Spread cm<sup>3</sup> : 0.7

100 s: (1.1)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250  
 travel mm : 1.10...1.50

2nd speed rpm : 400  
 travel mm : 3.00...3.60

3rd speed rpm : 850  
 travel mm : 6.70...7.30

4th speed rpm : 1250  
 travel mm : 10.30...10.50

5th speed rpm : 1350  
 travel mm : 11.40...11.80

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1240  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 1200

Del. quantity : 164.0...166.0  
1000 : (162.0...168.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1260...1270  
2nd rack travel in: 4.00  
Speed rpm : 1350...1380  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 69...77

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 300  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 700  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 850  
Rack travel in m: 12.20...12.40  
4th speed rpm : 350  
Rack travel in m: 10.60...10.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1000  
Pressure hPa : 1200  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 7.30...7.50  
2nd pressure hPa : 90

Rack travel in m: 7.50...7.60  
3rd pressure hPa : 830  
Rack travel in m: 11.70...11.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 195.0...199.0  
1000 s: (192.0...202.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 99.0...101.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1260...1270

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.70...4.90

Remarks: :



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : VOL 7,1 f 1  
 Edition : 18.09.91  
 Replaces : 24.4.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 846 051  
 Injection pump  
 Pump designation : PE6P110A32ORS8009  
 EP type number : 0 412 816 010  
 Governor  
 Governor design. : RQV250...1200PA953-1  
 K  
 Governor no. : 0 421 815 995

Customer-spec. information  
 Customer : VOLVO-TRUCK

Engine : TD73EA

1st version kW : 158.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 064

Inlet press., bar : 2.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90  
 : (3.75...3.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1200  
 Rack travel in mm : 11.40...11.50  
 Del. quantity cm<sup>3</sup>/ : 15.2...15.4  
 100 s : (15.0...15.6)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.7...5.1  
 Del. quantity cm<sup>3</sup>/ : 2.1...2.5  
 100 s : (1.8...2.8)  
 Spread cm<sup>3</sup> : 0.7  
 100 s : (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 250  
 travel mm : 1.10...1.50  
 2nd speed rpm : 400  
 travel mm : 3.00...3.60  
 3rd speed rpm : 850  
 travel mm : 6.70...7.30  
 4th speed rpm : 1250  
 travel mm : 10.30...10.50  
 5th speed rpm : 1350  
 travel mm : 11.40...11.80

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1240  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1200

Aneroid pressure h: 1200  
Del. quantity : 152.0...154.0  
1000 : (150.0...156.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.40  
Speed rpm : 1260...1270  
2nd rack travel in: 4.00  
Speed rpm : 1330...1360  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 69...77

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 300  
Rack travel in mm : 4.70...4.90

#### CONSTANT REGULATION

Speed rpm : 300...450

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 700  
Rack travel in m: 10.10...10.30  
3rd speed rpm : 1000  
Rack travel in m: 11.40...11.60  
4th speed rpm : 350  
Rack travel in m: 9.50...9.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1200  
Rack travel mm : 11.40...11.50

#### Measurement

Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 7.30...7.50

2nd pressure hPa : 90  
Rack travel in m: 7.50...7.60  
3rd pressure hPa : 740  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (155.0...165.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 99.0...101.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1260...1270

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.70...4.90

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 D16  
 Edition : 18.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 436 104FB  
 Injection pump  
 Pump designation : PES6MM100/120RS1143  
 EP type number : 0 413 406 137  
 Governor  
 Governor design. : RQV350...1200MW82-1  
 Governor no. : 0 420 083 153

Cust. part no. : 3281356

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CTA 8.3

1st version kW : 179.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.15...3.25  
 : (3.10...3.30)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1100  
 Rack travel in mm : 12.10...12.20  
 Del. quantity cm<sup>3</sup>/ : 13.4...13.6  
 100 s : (13.2...13.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 340.0  
 Rack travel in mm : 8.4...8.6  
 Del. quantity cm<sup>3</sup>/ : 1.2...1.6  
 100 s : (1.0...1.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1250  
 travel mm : 7.60...7.80  
 2nd speed rpm : 1350  
 travel mm : 8.60...9.00  
 3rd speed rpm : 350  
 travel mm : 1.20...1.60  
 4th speed rpm : 800  
 travel mm : 4.90...5.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 700  
 Del. quantity : 134.0...136.0  
 1000 : (132.0...138.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 42...50

Testing:  
1st rack travel in: 11.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.50  
Speed rpm : 1285...1315  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19  
Setting point w/out bumper spring  
Speed rpm : 340  
Rack travel in mm : 8.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 340  
Rack travel in mm : 8.40...8.60

CONSTANT REGULATION  
Speed rpm : 360...500

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 700  
Rack travel in m: 12.40...12.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 390  
Rack travel in m: 11.50...11.60  
2nd pressure hPa : 480  
Rack travel in m: 12.10...12.30  
3rd pressure hPa : 700  
Rack travel in m: 12.40...12.50

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

N20

1st version  
Aneroid pressure h: 700  
Speed rpm : 700  
Del.quantity cm3/ : 134.5...137.5  
1000 s: (132.0...140.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 115.0...117.0  
1000 s: (113.0...119.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (202.0...228.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 340  
Rack travel in mm : 8.40...8.60  
Del.quantity cm3/ : 12.0...16.0  
1000 s: (10.0...18.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D15  
 Edition : 20.09.91  
 Replaces : 07.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 436 109  
 Injection pump  
 Pump designation : PES6MM100/120RS1143  
 EP type number : 0 413 406 137  
 Governor  
 Governor design. : RGV300...1050MM82-4  
 Governor no. : 0 420 083 168

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA-830  
 1st version kW : 175.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 017  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,6  
 Test lines : 1 680 750 014  
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15  
 : (3.00...3.20)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 12.60...12.70  
 Del.quantity cm<sup>3</sup>/ : 14.8...15.0  
 100 s: (14.6...15.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 7.7...7.9  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1210  
 travel mm : 9.00...9.40  
 2nd speed rpm : 1100  
 travel mm : 7.90...8.10  
 3rd speed rpm : 550  
 travel mm : 3.00...3.60  
 4th speed rpm : 300  
 travel mm : 1.10...1.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 900  
 Del.quantity : 148.0...150.0  
 1000 : (146.0...152.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version

Control lever  
position degrees: 42...50

Testing:  
1st rack travel in: 11.60  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.8

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.30  
Speed rpm : 300  
Rack travel in mm : 7.70...7.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.40...10.60

Measurement  
Speed 1/min : 500

1st pressure hPa : 225  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 450  
Rack travel in m: 11.90...12.30  
3rd pressure hPa : 900  
Rack travel in m: 12.60...12.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 145.5...148.5  
1000 s: (143.0...151.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500

N22

Del.quantity cm<sup>3</sup>/ : 92.0...94.0  
1000 s: (90.0...96.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 215.0...225.0  
1000 s: (212.0...228.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.70...7.90  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3915581

Start-of-delivery mark/lock = 8.0°  
angular displacement of the cam after  
start of delivery of cylinder 1.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : VOL 4,5 N 1  
 Edition : 20.09.91  
 Replaces : 07.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 131  
 Injection pump  
 Pump designation : PES4MM100/32ORS1220  
 EP type number : 0 413 404 116  
 Governor  
 Governor design. : RQV300...1100MW39-4  
 Governor no. : 0 420 083 067

Customer-spec. information  
 Customer : VME

Engine : TD45B

1st version kW : 82.5  
 Rated speed : 2200

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 173...176  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32  
 Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00

N23

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 700  
 Rack travel in mm : 11.70...11.80  
 Del.quantity cm<sup>3</sup>/ : 9.4...9.6  
 100 s : (9.2...9.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.2...6.4  
 Del.quantity cm<sup>3</sup>/ : 1.3...1.7  
 100 s : (1.0...1.9)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1220  
 travel mm : 9.20...9.60  
 2nd speed rpm : 1150  
 travel mm : 8.40...8.60  
 3rd speed rpm : 420  
 travel mm : 1.70...2.30  
 4th speed rpm : 300  
 travel mm : 1.00...1.40

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 700  
 Del.quantity : 94.0...96.0  
 1000 : (92.0...98.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version

Control lever  
position degrees: 100...108

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40

#### START CUT-OUT

Speed 1/min : 220 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1000  
Del.quantity cm3/ : 96.5...99.5  
1000 s: (94.0...102.0)  
Spread cm3 : 5.50  
1000 s: (7.0)  
Speed rpm : 900  
Del.quantity cm3/ : 95.5...98.5  
1000 s: (93.0...101.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)

#### LOW IDLE

Speed rpm : 300

N24

Rack travel in mm : 6.20...6.40  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks: :



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 I 3  
 Edition : 08.10.91  
 Replaces : 07.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 133  
 Injection pump  
 Pump designation : PES4MW100/720RS1212  
 EP type number : 0 413 404 114  
 Governor  
 Governor design. : RGV300...1200MW50-20  
 Governor no. : 0 420 083 252

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 364 LA

1st version kW : 99.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

N25

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200  
 Rack travel in mm : 13.50...13.60  
 Del. quantity cm<sup>3</sup>/ : 9.8...10.0  
 100 s: (9.6...10.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.8...7.0  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.50...9.90  
 2nd speed rpm : 1340  
 travel mm : 8.50...8.70  
 3rd speed rpm : 500  
 travel mm : 2.70...3.30  
 4th speed rpm : 300  
 travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1340  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 700  
 Del. quantity : 98.0...100.0  
 1000 : (96.0...102.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 104...112

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1390...1420  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 73...81  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.9

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.80...7.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.90...11.00

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.90...12.00  
2nd pressure hPa : 310  
Rack travel in m: 12.80...13.10  
3rd pressure hPa : 700  
Rack travel in m: 13.50...13.60

#### START CUT-OUT

Speed 1/min : 220 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 83.5...86.5  
1000 s: (81.0...89.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 40.0...42.0  
1000 s: (38.0...44.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...7.00  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB 4,0 I 5  
 Edition : 20.09.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 136  
 Injection pump  
 Pump designation : PES4MW100/720RS1212  
 EP type number : 0 413 404 114  
 Governor  
 Governor design. : RQV300...1300MW123-1  
 Governor no. : 0 420 083 256

Customer spec. information  
 Customer : MB-NFZ

Engine : OM364LA

1st version kW : 102.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300  
 Rack travel in mm : 13.20...13.30  
 Del.quantity cm<sup>3</sup>/ : 10.1...10.3  
 100 s: (9.9...10.5)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1450  
 travel mm : 9.50...9.90  
 2nd speed rpm : 1340  
 travel mm : 8.50...8.70  
 3rd speed rpm : 500  
 travel mm : 2.70...3.30  
 4th speed rpm : 300  
 travel mm : 1.30...1.70

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1340  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del.quantity : 101.0...103.0  
 1000 : (99.0...105.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 107...115

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 320...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.20

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 400  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 700  
Rack travel in m: 13.20...13.30

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 36.0...38.0  
1000 s: (34.0...40.0)

BREAKAWAY

1st version  
1mm rack travel less than

Full load rack tr: 12.20  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks: